NetCommWireless

User **Guide**

NP731 – Outdoor Dual Band WiFi N Access Point

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Save our environment

When this equipment has reached the end of its useful life, it must be taken to a recycling centre and processed separately from domestic waste.

The cardboard box, the plastic contained in the packaging, and the parts that make up this device can be recycled in accordance with regionally established regulations. Never dispose of this electronic equipment along with your household waste. You may be subject to penalties or sanctions under the law. Instead, ask for disposal instructions from your municipal government.

Please be responsible and protect our environment.

This manual covers the following products:

NP731 Outdoor Dual Band WiFi N Access Point

DOCUMENT VERSION	DATE
1.0 - Initial document release	9/1/2015

Table 1 - Document Revision History

NetCommWireless

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Overview

Introduction

This document provides you all the information you need to set up, configure and use the Outdoor Dual Band WiFi N Access Point.

Target audience

This guide is intended to be used by wireless service providers or network administrators to set up a network environment using the NP731 system. It contains step-by-step procedures and graphic examples to guide IT staff or individuals with some network system knowledge to complete the installation.

Prerequisites

Before continuing with the installation of your NP731, please confirm that you have the following:

- A device with a working Ethernet network adapter.
- Wireless client device(s) if using the NP731 to create a wireless network.
- A web browser such as Internet Explorer, Mozilla Firefox or Google Chrome.

Notation

The following symbols are used in this user guide:

The following note requires attention.

The following note provides a warning.

The following note provides useful information.

Product introduction

Product overview

Designed to meet the needs of today's most demanding wireless LAN deployments, the NP731 offers a solution to create a reliable and scalable wireless network.

The NP731 is an outdoor device that will operate in access point, repeater and WDS bridge mode. Its rugged IP68-rated metal housing is weatherproof, pressure balancing, water-tight and rust-resistant, making it an ideal solution for deployments in harsh conditions, such as outdoor or industrial environments.

With its multi-mode set up, the device can be used in many instances to increase and enhance wireless coverage.

Package contents

The NP731 package includes:

#	ITEM	DESCRIPTION
1		NetComm Wireless NP731 Outdoor Dual Band WiFi N Access Point
2		Dual band 5dBi Outdoor Omni Antennas
3		Ground wire (green)
4		PoE injector
5		10m RJ45 Outdoor-grade Ethernet cable
6		Detachment tool (for RJ45 connector)
7		Mounting kit
8		Quick Start Guide
9	Not pictured	Warranty Card

If any of these items are missing or damaged, please contact NetComm Wireless Support immediately. The NetComm Wireless Support website can be found at: http://support.netcommwireless.com.

We recommend that you keep the original packaging materials in case repair or maintenance is necessary. This will protect the NP731 from damage during transport.

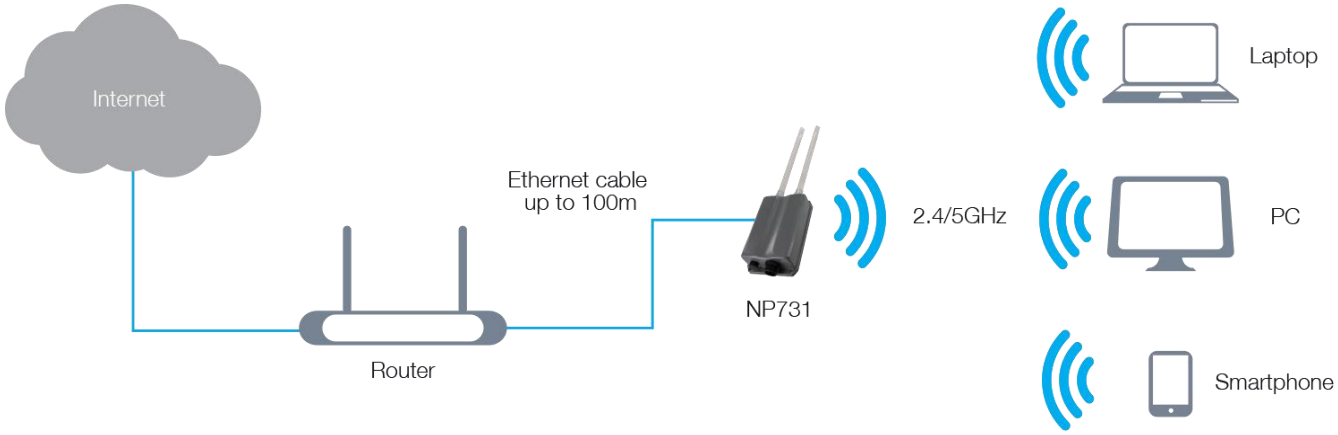
System concept

The NP731 has four modes of operation:

1. **Repeater mode (default)** – the NP731 repeats the wireless signal of your existing network to provide coverage to a greater area of your premises.

Note: The NP731 can only rebroadcast the wireless network using the same band, i.e if the router is broadcasting on 2.4GHz, the NP731 can only repeat the signal on 2.4GHz. Additionally, if the router broadcasts on both 2.4GHz and 5GHz simultaneously, the repeater may only repeat one of those bands.

2. **Access Point mode** – the NP731 connects to an existing router via Ethernet and provides a wireless signal for wireless devices. This is useful in situations where there is no existing wireless access point or where you wish to provide a wireless signal to a remote area (up to 100 metres) from where the router is located.



Note: The NP731 provides wireless connectivity on the 2.4GHz or 5GHz band but not on both bands simultaneously.

3. **CPE mode** – the NP731 connects wirelessly to a remote network and provides access to that network to clients connected via Ethernet. Use of a switch is required for multiple clients.

4. **WDS mode** – the NP731 connects to up to 16 other NP731 units to create a wireless mesh network. This is similar to repeater mode but in WDS mode, the NP731 uses a single MAC address to provide seamless roaming.

Hardware overview

Bottom Panel

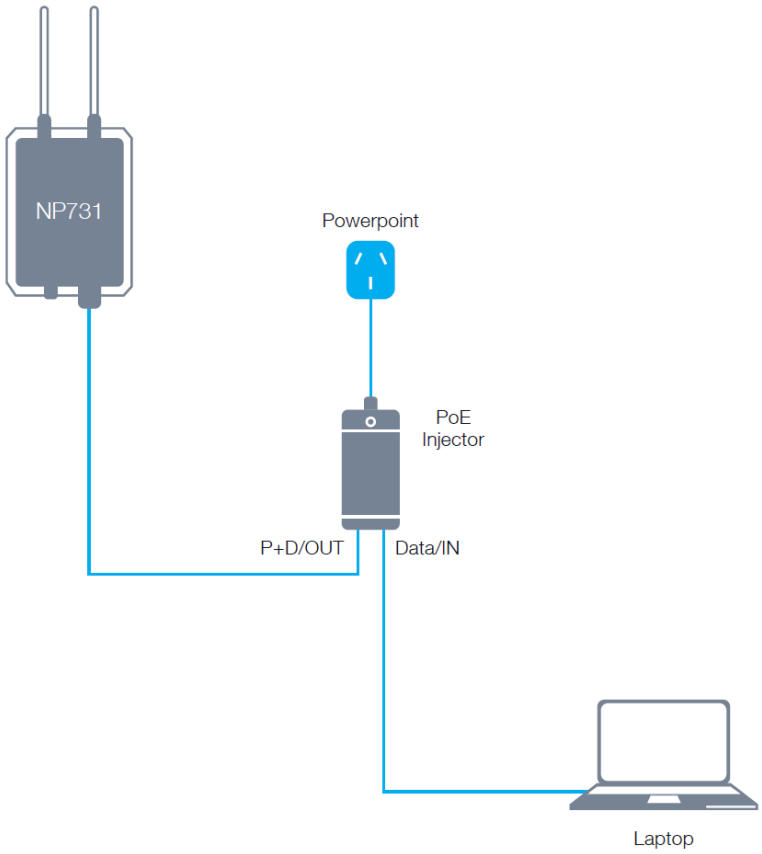
#	NAME	DESCRIPTION
1	Ventilation Valve	Due to fluctuations in temperature and humidity, water vapour inside the unit may condense. This valve provides ventilation to prevent moisture from building up inside the unit.
2	Ground connector	Used to attach the ground wire.
3	PoE connector	Used to connect the NP731 to either the PoE injector or to a router providing Power over Ethernet (PoE).

Top Panel

#	NAME	DESCRIPTION
1	N-type connectors	Connect antennas here. Use both antennas in conjunction for 802.11n MIMO optimized performance.

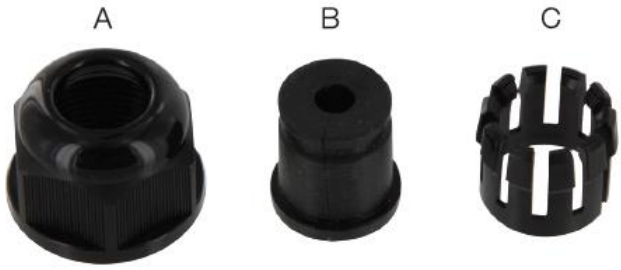
Hardware Installation

The following diagram illustrates the basic network topology that should be used for testing and configuration:



1. Connect the two Dual band antennas to the primary and secondary N-type antenna connectors on the NP731

2. Unscrew the weather seal from the PoE port and disassemble it so that it is in three parts.



3. Place the Ethernet cable through the bottom piece (A) first, as shown below.

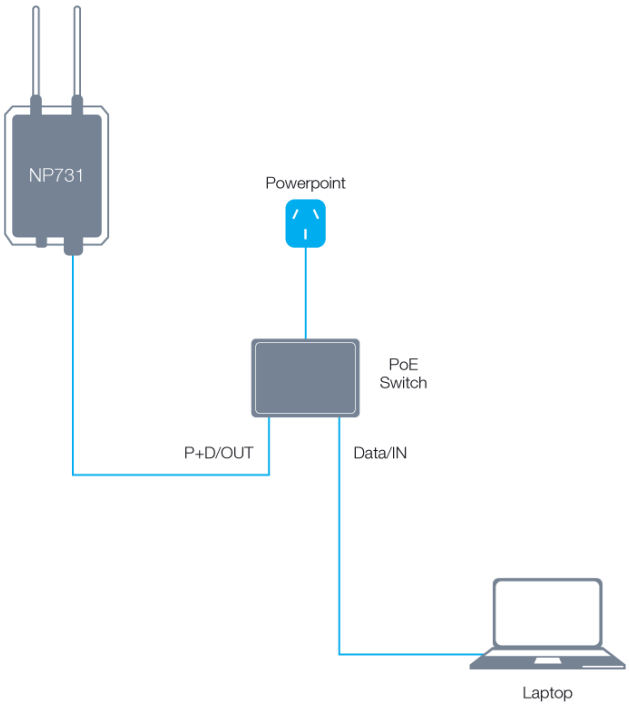
4. Open the middle piece (B) and slide the Ethernet cable into it. Take care to orient the middle piece as shown below.

5. Place the third piece (C) over the top with the same orientation as shown below.

6. Connect the weather sealed end of the Ethernet cable to the Ethernet port of the NP731. Screw part A onto the Ethernet port of the NP731. Connect the other end of the Ethernet cable to the P+D/OUT port of the PoE injector.
7. Connect one end of another Ethernet cable to the DATA/IN port of the PoE injector and the other end of the cable to a computer.
8. Connect the power cord to the PoE injector and power it on.

Alternative configuration

When you have completed the configuration of the NP731, you can connect it to a PoE switch to provide power and data connectivity. The following diagram illustrates the alternative network topology.



Accessing the NP731's user interface

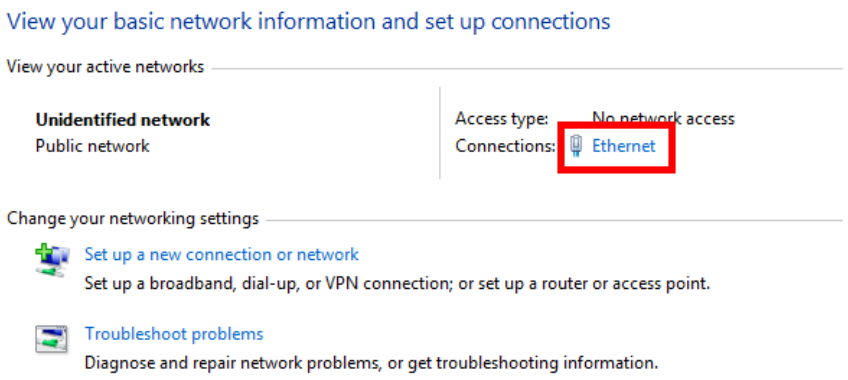
The NP731 offers a web based configuration page. After completing the hardware installation above, the NP731 can be configured through a computer using a web browser with JavaScript enabled.

The NP731 has a static IP address of 192.168.1.254. To access the web management interface, you must set the IP address of your computer to be within the range of 192.168.1.2 to 192.168.1.253.

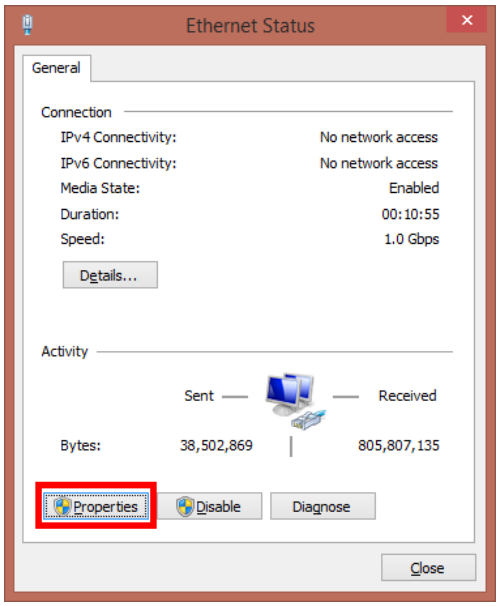
Setting the IP address of your computer

To set the IP address of your computer:

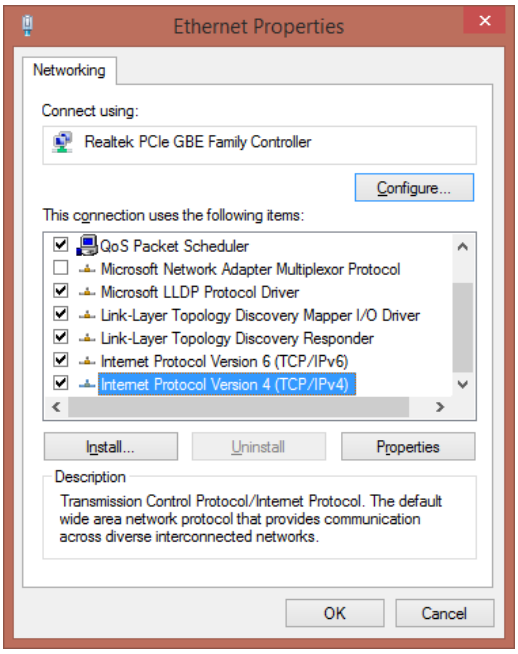
1. Open the Control Panel then select **Network and Sharing Center**.
2. Select the Ethernet connection for the Unidentified network.


View your basic network information and set up connections
View your active networks
Unidentified network
Public network
Access type: No network access
Connections: Ethernet
Change your networking settings
Set up a new connection or network
Set up a broadband, dial-up, or VPN connection; or set up a router or access point.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

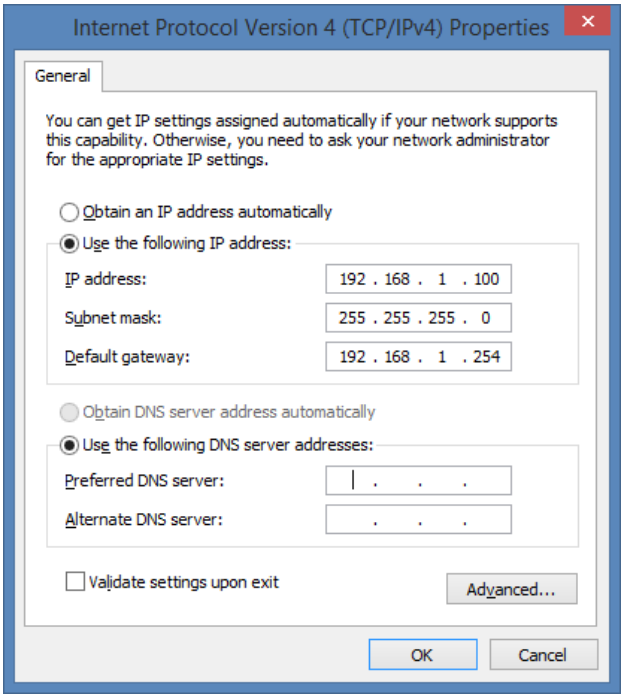
3. Click on the **Properties** button.



4. Select **Internet Protocol Version 4 (TCP/IPv4)** and then click on the **Properties** button.



5. Select the **Use the following IP address** option, then enter an IP address between the range of 192.168.1.2 and 192.168.1.253. In the **Subnet mask** field, enter 255.255.255.0. Click the **OK** button.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 100
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 1 . 254
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

6. Close the Ethernet Properties and Ethernet Status windows.

Logging in to the NP731

To access the NP731's user interface:

1. Open a web browser and enter http://192.168.1.254 into the address bar. Press **Enter**. The login page of the NP731 is displayed.

2. Enter **admin** into both the Username and Password fields, then click the **Login** button

Advanced configuration

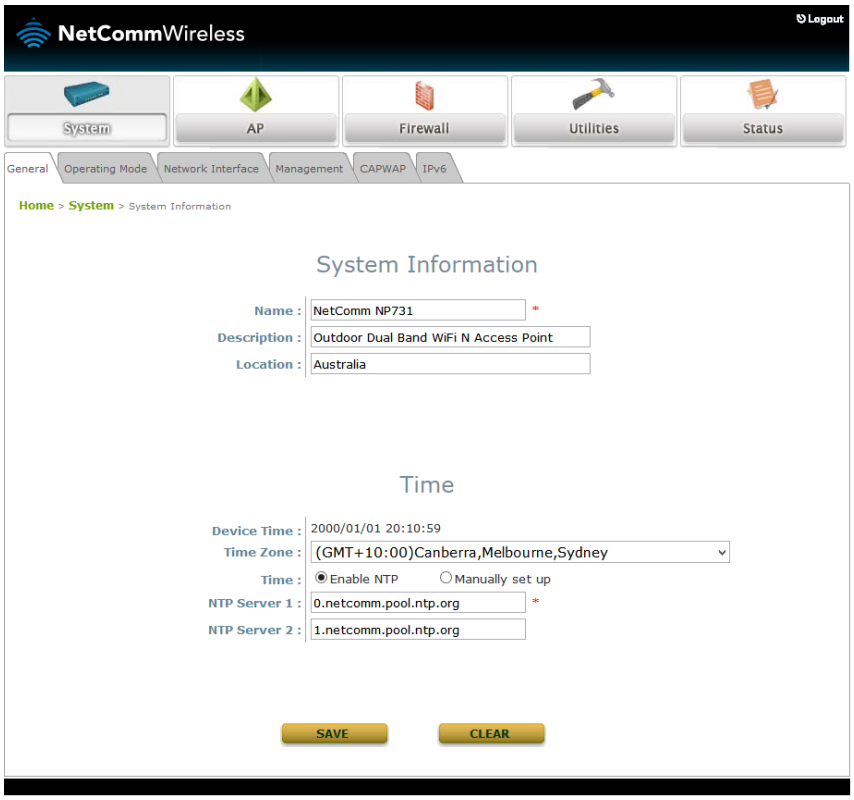
The device's interface consists of 5 main menu items listed along the top of the screen; System, AP, Firewall, Utilities and Status. You can select any of these menu items to reveal additional sub-menus.

System

The System menu provides the configuration of network related settings.

General

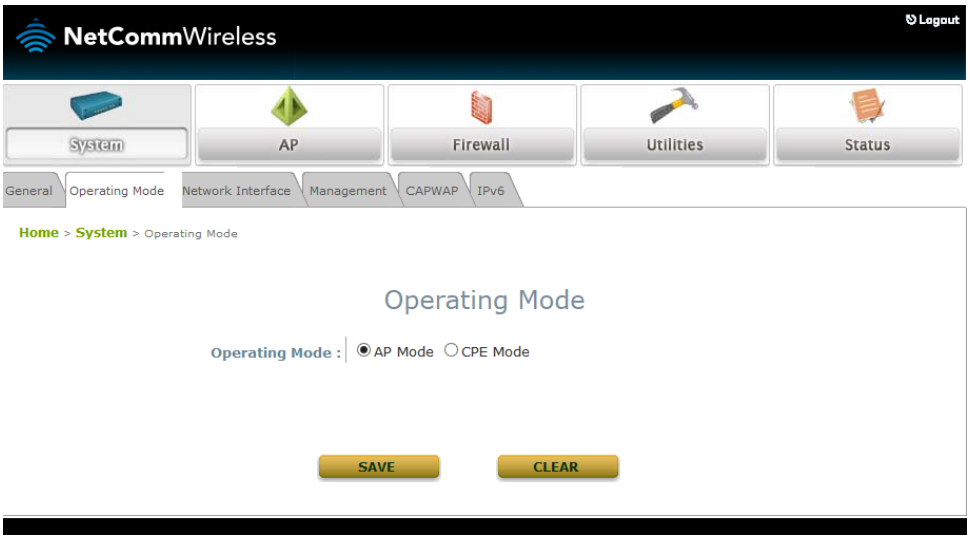
The General tab includes configuration options for System Information to identify the access point as well as NTP server configuration. The fields marked with a red asterisk are mandatory fields and must contain some data in order for the access point to function correctly.



FIELD	DESCRIPTION
System Information	
Name	This is a name to identify the access point on the network and is a mandatory field.
Description	An optional field used to describe the access point. This is useful for identification purposes where multiple access points are being used.
Location	An optional field that describes the location of the access point. This is useful for identification purposes where multiple access points are being used.
Time	
Device Time	Displays the time on the device.
Time Zone	Used to select the time zone in which the device is located.
Time	Selects whether the access point should retrieve the time from a time server or use a manually specified time.
NTP Server 1	A mandatory field if NTP is enabled. You must specify at least one NTP server for the access point to synchronize its time.
NTP Server 2	An optional secondary time server address.

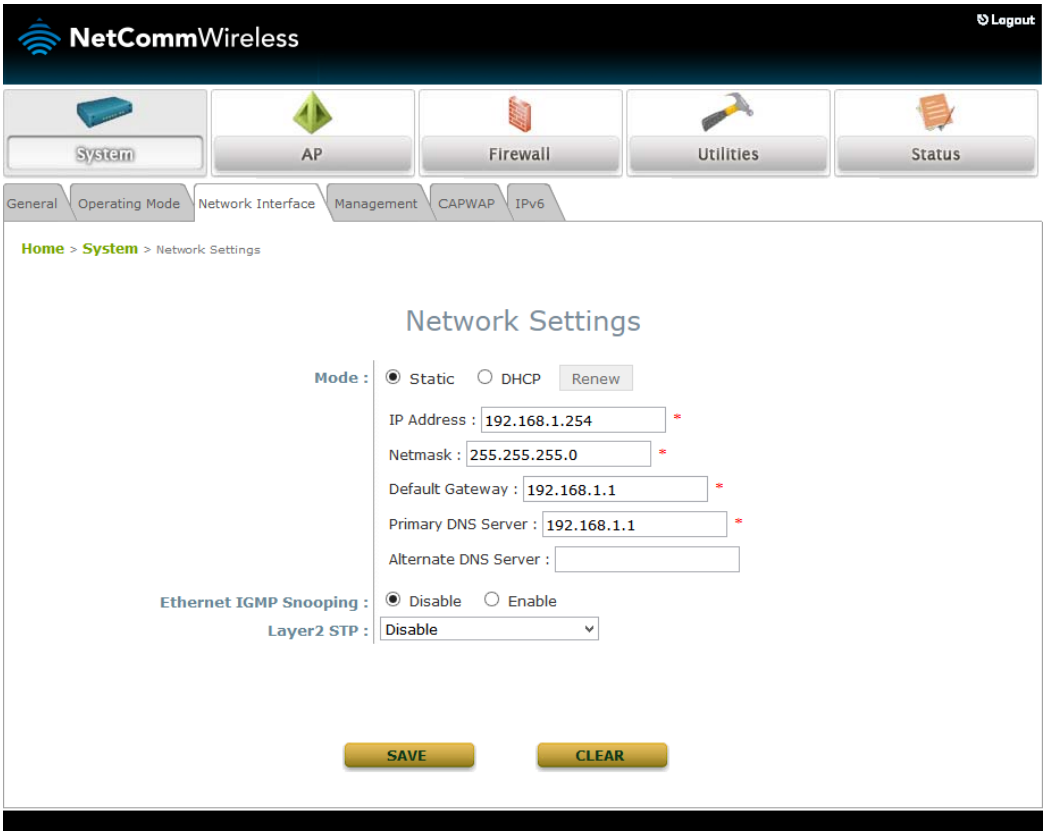
Operating Mode

The Operating Mode tab allows you to select between Access Point or CPE mode. To change the mode of operation, select the desired option and then click the Save button. Click the OK button on the pop-up confirmation window to reboot the access point so that the change can take effect. When set to CPE mode, the NP731 becomes a DHCP server operating on the 192.168.20.X address range and retrieves a DHCP client address for the WAN interface.



Network Interface

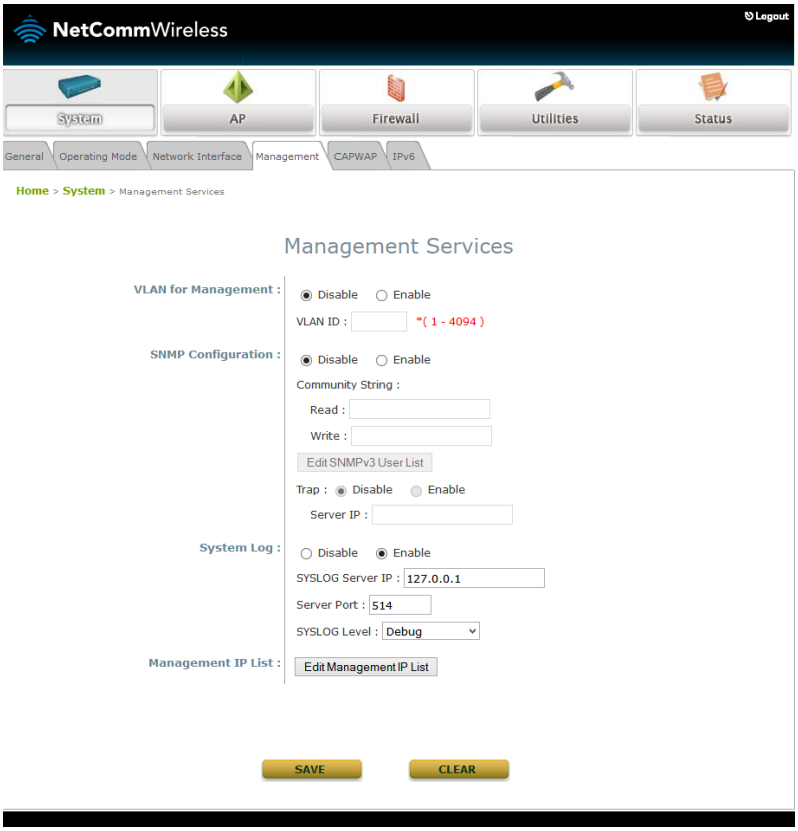
The Network Interface tab provides you with the ability to configure network settings.



FIELD	DESCRIPTION
Network Settings	
Mode	Specifies whether the access point should use a Static IP or a DHCP address. When Static is selected, you must specify an IP address, Netmask, Default Gateway and Primary DNS Server.
Ethernet IGMP Snooping	Enables or disables the IGMP Snooping function. When enabled, the access point forwards IGMP traffic transferred via the access point's network interface and the IP multicast host. Registration information is recorded and sorted into multicast groups. The internal switch forwards traffic only to those ports that request multicast traffic. Adversely, without IGMP snooping, multicast traffic is treated like broadcast traffic, with packets forwarded to all ports causing network inefficiencies.
Layer2 STP	Enables or disables the Layer2 Spanning Tree Protocol. If the access point is set up to bridge other network components, this option can be enabled to prevent undesired loops because a broadcasting storm may occur in a multi-switch environment where broadcast packets are forwarded in an endless loop between switches. Enabling Layer2 STP can lower undesired occurrences of broadcast storms.

Management

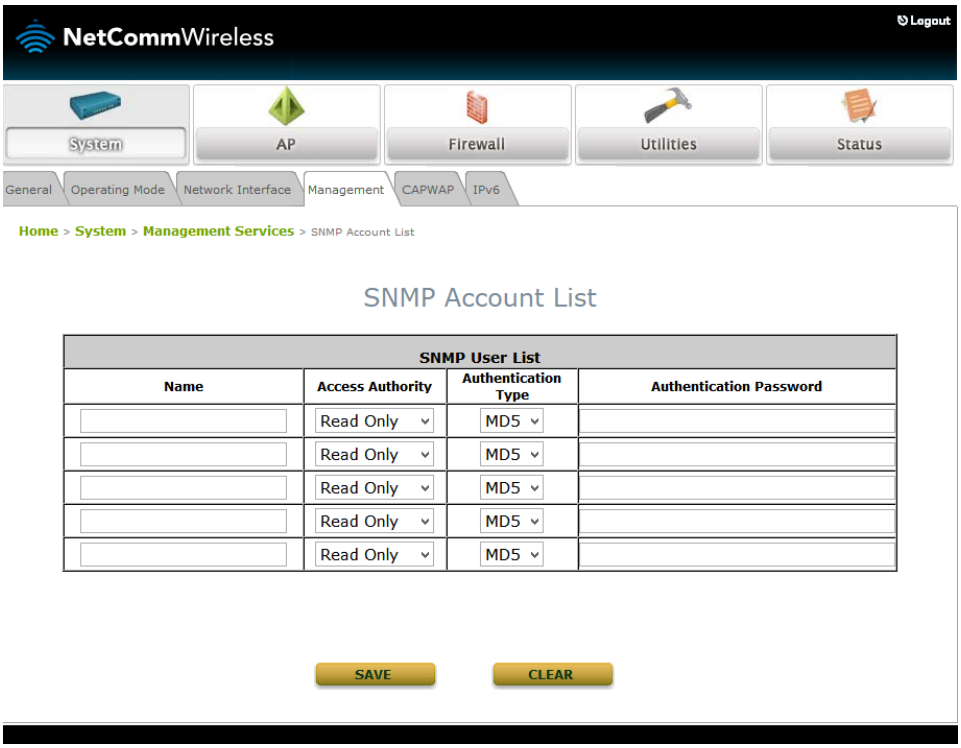
Management services such as VLAN, SNMP and the System log may be configured via this page.



FIELD	DESCRIPTION
Management Services	
VLAN for Management	When this is enabled, management traffic from the system is tagged with a VLAN ID. To access the VLAN, traffic must be tagged with the same VLAN ID.
SNMP Configuration	When SNMP is enabled, an administrator can obtain system information and configure settings of the access point remotely.
System Log	When enabled, the access point can log system activity to a remote syslog server.
Management IP List	Select this option to edit the Management IP list.

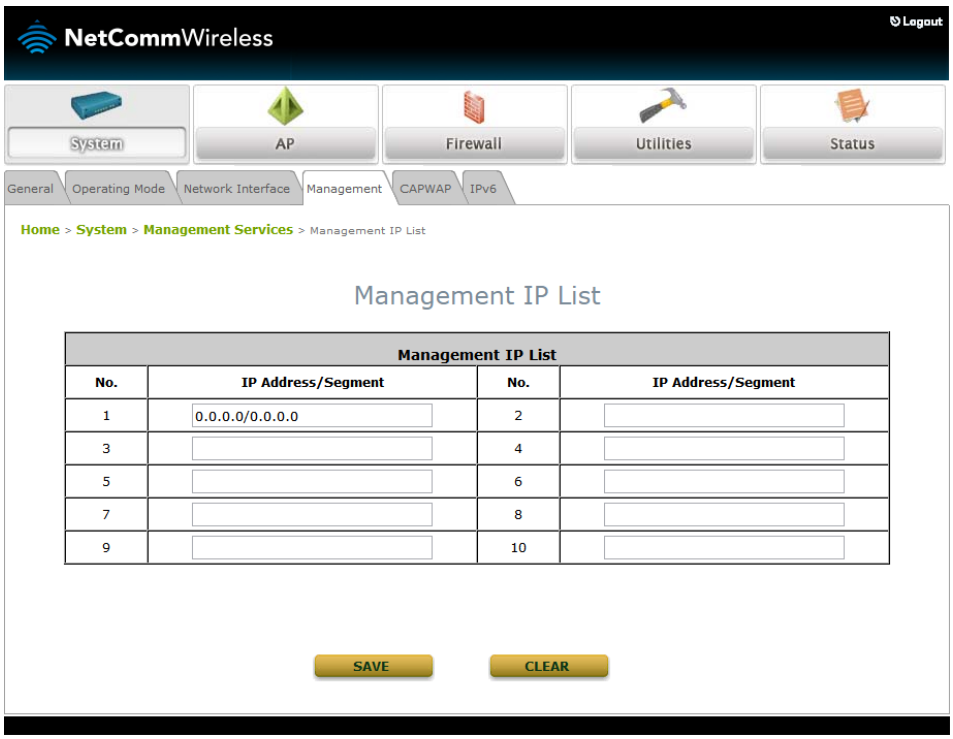
SNMP Account List

The System allow 5 SNMP users with Read or Read & Write access. Use the SNMP Account List page to configure access rights.



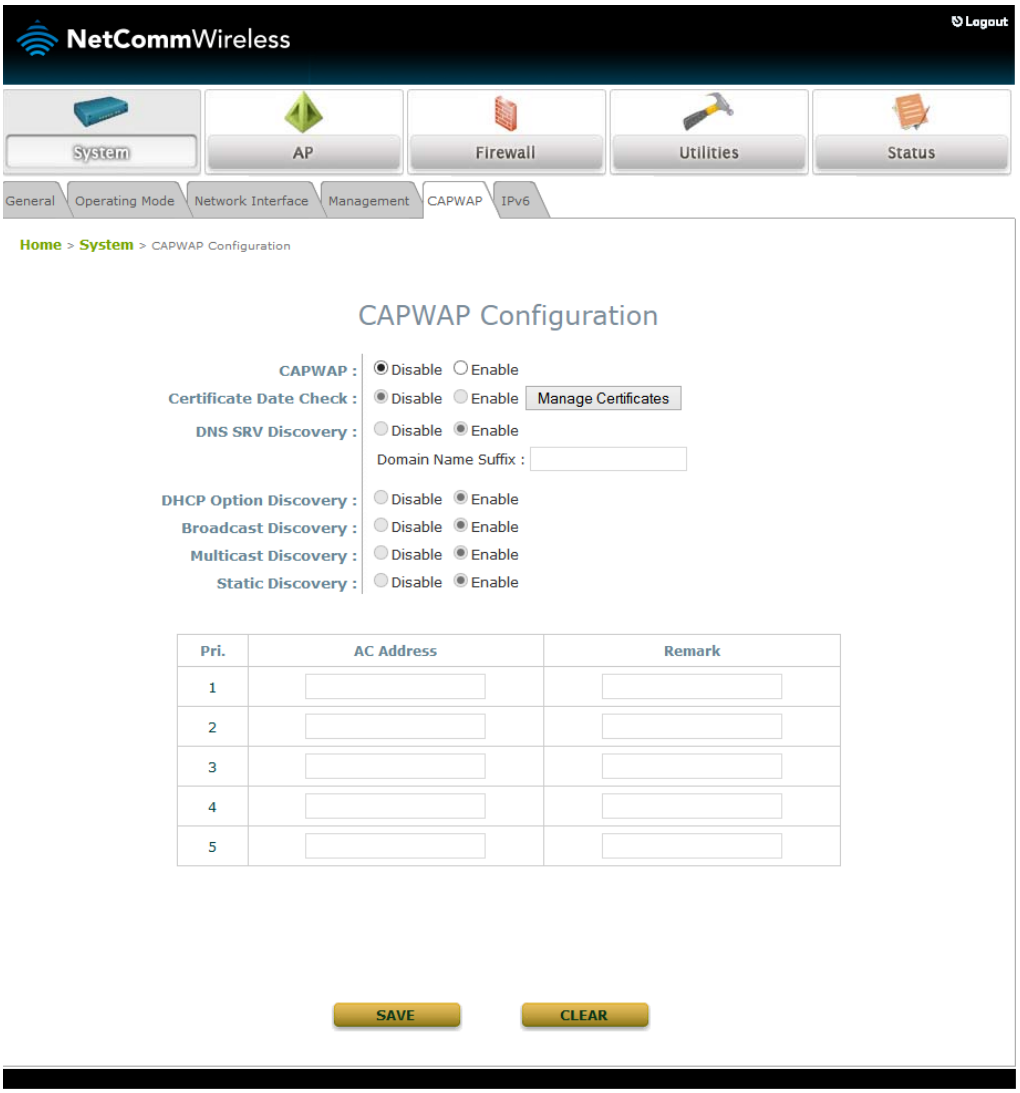
Management IP List

The administrator can grant access to the web management interface by specifying a list of IP addresses or ranges of IP addresses. These addresses may be LAN or WAN addresses. Use this page to configure the IP addresses that are allowed access.



CAPWAP

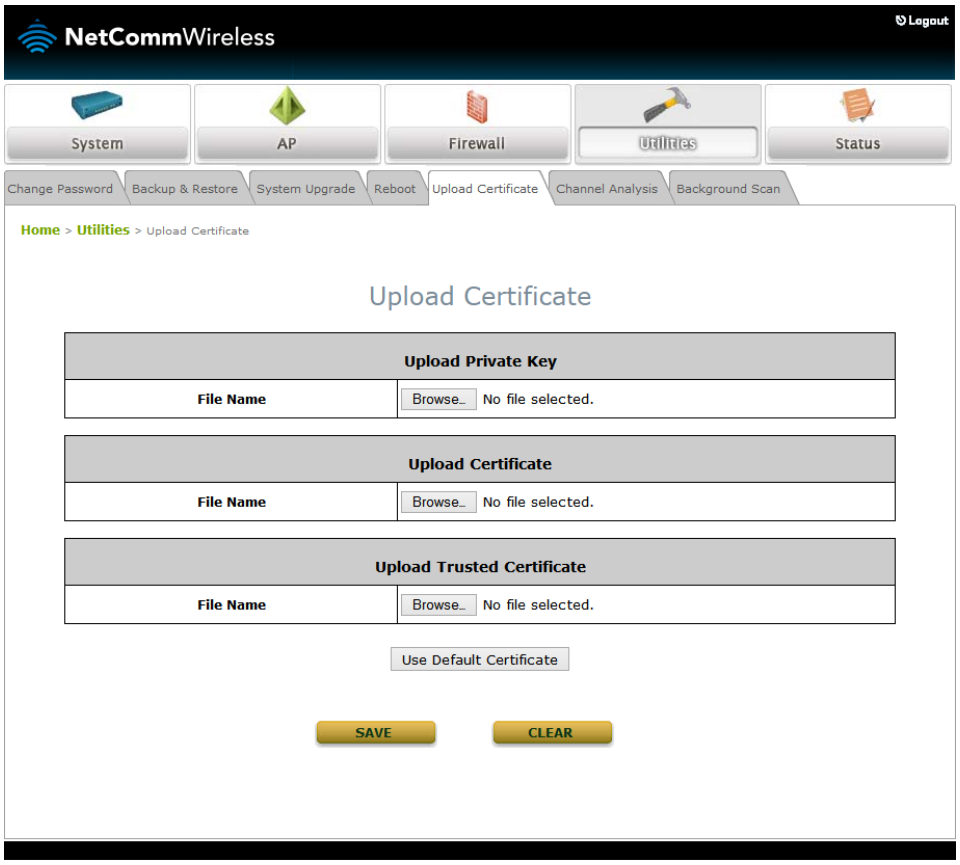
CAPWAP is a standard interoperable protocol that enables a controller to manage a collection of wireless access points. There are 5 methods of auto AP discovery, namely DNS SRV, DHCP option, Broadcast, Multicast and Static.



FIELD	DESCRIPTION
CAPWAP Configuration	
CAPWAP	Enables or disables the CAPWAP function.
Certificate Date Check	To enable this, select the Enable option then click the Manage Certificates button to display the Upload Certificate page. See below for details.
DNS SRV Discovery	Enables or disables the DNS SRV Discovery method.
DHCP Option Discovery	Enables or disables the DHCP Option Discovery method.
Broadcast Discovery	Enables or disables the Broadcast Discovery method.
Multicast Discovery	Enables or disables the Multicast Discovery method.
Static Discovery	Enables or disables the Static Discovery method.
AC Address	The IP address of the access controller. The access point attempts to discover the controllers from the top down, so if the first address is not reachable, it will attempt to find the second controller and so on.

Manage Certificates

Use the Browse button to locate the appropriate certificate files on your computer, then click the Save button to save your settings.



IPv6

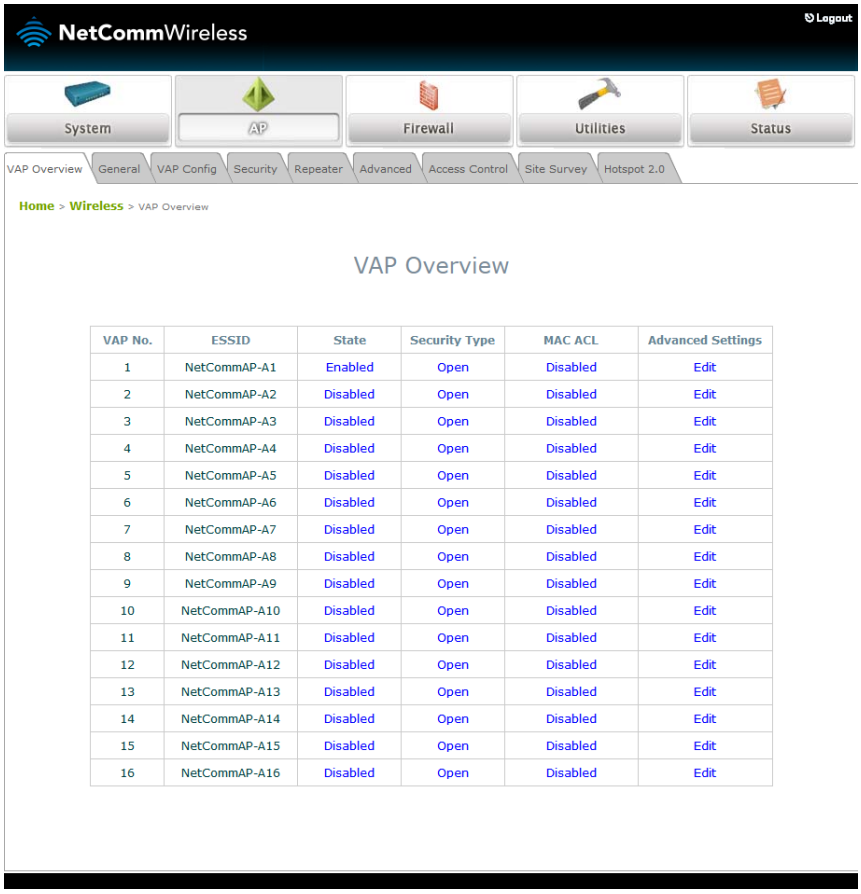
The access point supports both IPv4 and IPv6 address schemes. IPv6 is disabled by default but can be enabled on this screen. When it is enabled, you can choose whether the access point should have a static IP address or be assigned a DHCP address.

AP

The AP section provides configuration options for the access point function. The NP731 supports up to sixteen Virtual Access Points (VAPs). Each VAP can have its own settings (e.g. ESSID, VLAN ID, security settings, etc).

VAP Overview

This page displays a summary of the virtual access points and their statuses. To use more than one virtual access point, the NP731 must have repeater mode disabled. See the Repeater section for more information.



VAP No.	ESSID	State	Security Type	MAC ACL	Advanced Settings
1	NetCommAP-A1	Enabled	Open	Disabled	Edit
2	NetCommAP-A2	Disabled	Open	Disabled	Edit
3	NetCommAP-A3	Disabled	Open	Disabled	Edit
4	NetCommAP-A4	Disabled	Open	Disabled	Edit
5	NetCommAP-A5	Disabled	Open	Disabled	Edit
6	NetCommAP-A6	Disabled	Open	Disabled	Edit
7	NetCommAP-A7	Disabled	Open	Disabled	Edit
8	NetCommAP-A8	Disabled	Open	Disabled	Edit
9	NetCommAP-A9	Disabled	Open	Disabled	Edit
10	NetCommAP-A10	Disabled	Open	Disabled	Edit
11	NetCommAP-A11	Disabled	Open	Disabled	Edit
12	NetCommAP-A12	Disabled	Open	Disabled	Edit
13	NetCommAP-A13	Disabled	Open	Disabled	Edit
14	NetCommAP-A14	Disabled	Open	Disabled	Edit
15	NetCommAP-A15	Disabled	Open	Disabled	Edit
16	NetCommAP-A16	Disabled	Open	Disabled	Edit

General

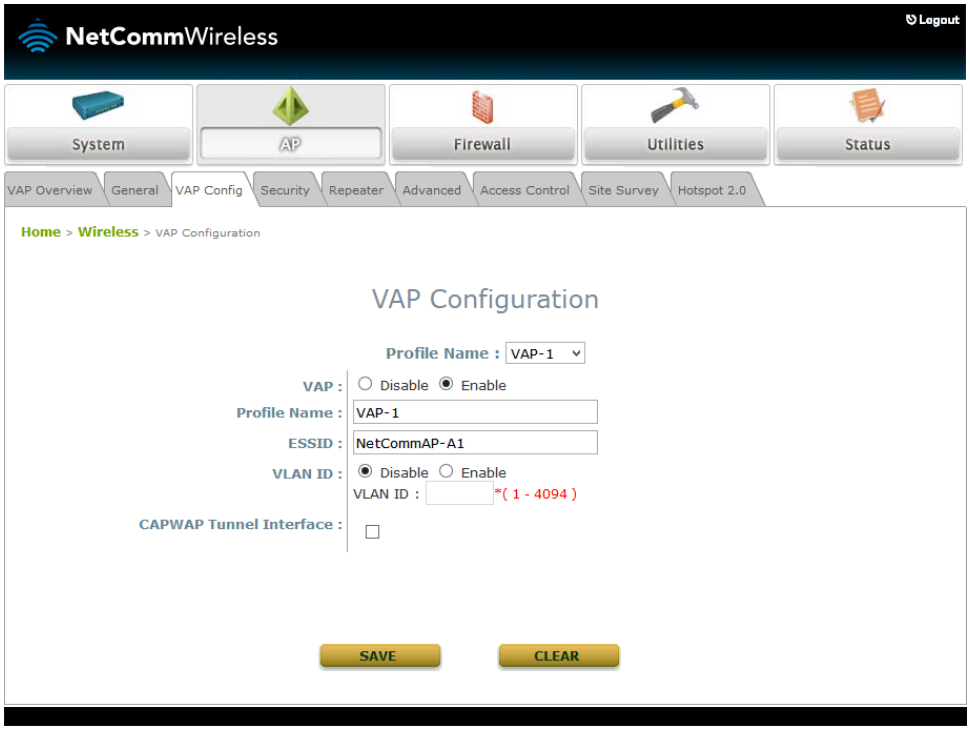
Here you can configure the general AP wireless settings.

FIELD	DESCRIPTION
General Settings	
Band	Select the desired wireless band. Available options are Disabled, 2.4GHz or 5GHz.
Protocol	Select the appropriate wireless protocol: 802.11a, 802.11b, 802.11g, 802.11b+802.11g, 802.11g+802.11n, 802.11a+802.11n, 802.11ac or select Disable if the wireless function is not required. Select the Pure 11n option to enable 802.11n only.
Short Preamble	The short preamble with a 56-bit synchronization field can improve WLAN transmission efficiency. Select Enable to use Short Preamble or Disable to use Long Preamble.
Short Guard Interval	The guard interval is the space between symbols (characters) being transmitted to eliminate inter-symbol interference. In order to further boost throughput with 802.11n, the short guard interval is half of what it used to be.
Channel Width	A wider channel width increases the bandwidth available. This option only appears when a protocol using 802.11n is selected.
Channel Width Extension	This option restricts the channel selection when 40MHz channel width is selected.
Channel	Use the drop down list to select a channel for the WiFi network. The default channel is 6. For North America, you may select channels 1 to 11 while channels 1 to 13 are available for Europe.
Max Transmit Rate	This is the maximum wireless transmission rate. When set to Auto, the access point will use the highest possible rate.
Transmit Power	The signal strength transmitted by the access point. Each level signifies are decrement of 1dBm from the highest power. Level 1 is the highest transmission power, level 2 is the highest power minus 1dBm and so on.
ACK Timeout	Indicates a period of time when the system waits for an acknowledgment frame sent back from a station without retransmission.

Beacon Interval	Indicates how often the beacon signal is sent from the access point.
Airtime Fairness	When multiple protocols are enabled, e.g. 802.11b + 802.11g, they can occupy airtime and affect throughput for 802.11n devices. When this option is enabled, the access point ensures all devices with different band compatibilities have the same air time. When set to Preferred Airtime, priority is given to devices using the 802.11n protocol.
Packet Delay Threshold	When the access point is busy transmitting to a client which is busy or out of range, it is delayed from transmitting to other clients. When this option is enabled, this transmission queue flushing mechanism drops packets and immediately begins to process others if the queue has been processed for more than x milliseconds.
Idle Timeout	The time after which a client disconnects when inactivity reaches the configured amount of time in seconds.
Interference Detection	When utilization, latency (and invalid packet rate) of the current channel or adjacent channel reaches the configured threshold (in %), the AP switches to a different channel.
WME Configuration	Access priority can be configured using different parameters.
Transmission Rate Threshold	When the transmission rate drops below the configured threshold, the client is dropped. This ensures high throughput for all clients.

VAP Configuration

This section provides configuration of each virtual access point with settings such as Profile Name, ESSID and VLAN ID.



FIELD	DESCRIPTION
VAP Configuration	
VAP	Enables or disables the selected VAP.
Profile Name	The profile name of the virtual access point for identification and management purposes.
ESSID	The Extended Service Set ID serves as an identifier for clients to associate with the specific VAP.
VLAN ID	The NP731 supports tagged VLANs (virtual LANs). To enable the VLAN function, each VAP should be given a unique VLAN ID between the range of 1 and 4094.
CAPWAP Tunnel Interface	Select this option to designate traffic for the VAP to pass through the CAPWAP tunnel established between the AP and the controller.

Security

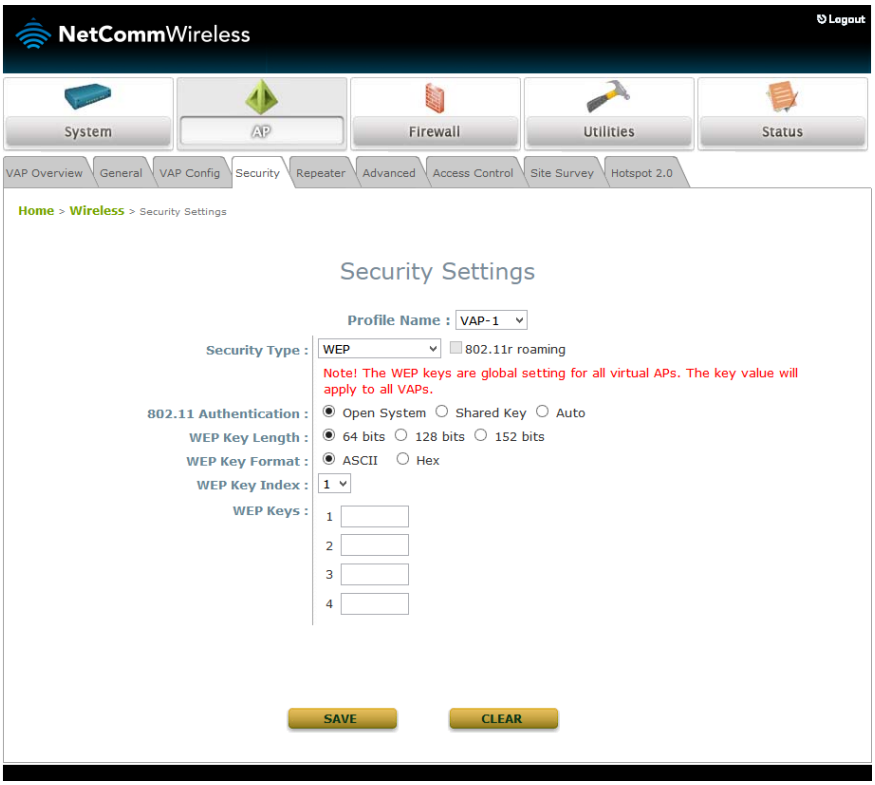
Each VAP profile can be configured with independent wireless authentication and data encryption methods. A description of each of the security types is listed below.

Open

When security type is set to Open, the access point provides no encryption or authentication for clients connecting to the VAP.

WEP

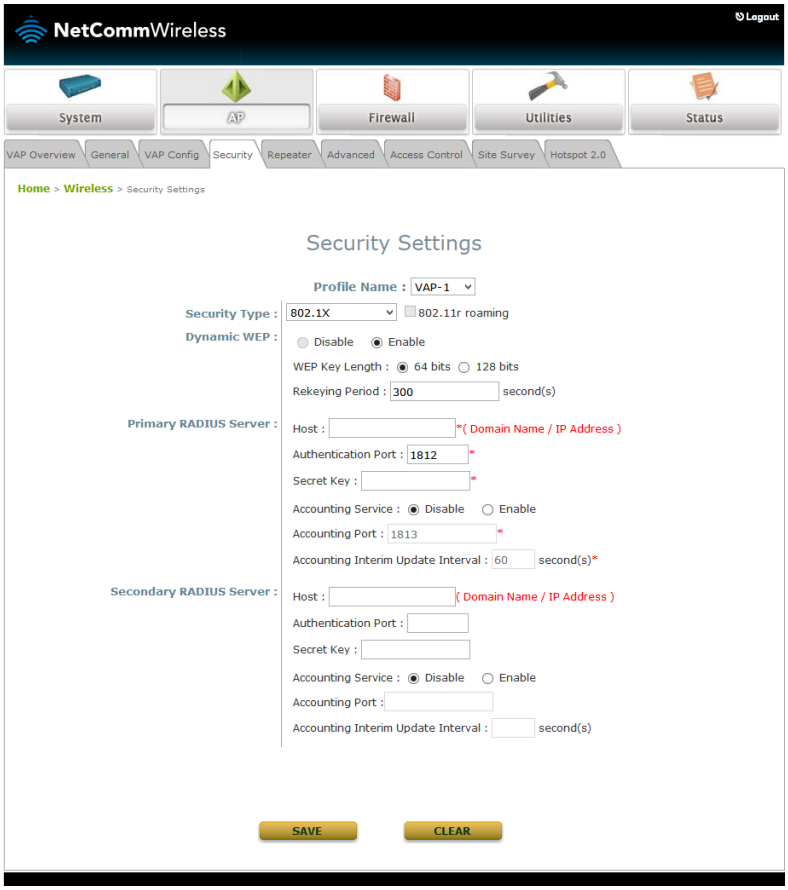
Wired Equivalent Privacy (WEP) is a data encryption mechanism based on a 64-bit, 128-bit or 152-bit shared key algorithm.



FIELD	DESCRIPTION
Security Settings	
802.11 Authentication	Select from Open System, Shared Key or Auto.
WEP Key Length	Select from 64-bit, 128-bit, 152-bit key length.
WEP Key Format	Select from ASCII or Hex format for the WEP key.
WEP Key Index	Select a key index from 1~4. The WEP key index is a number that specifies which WEP key will be used for the encryption of wireless frames during data transmission.
WEP Keys	Provide the pre-defined WEP key value; the system supports up to 4 sets of WEP keys.

802.1X

When 802.1X authentication is selected, RADIUS authentication and Dynamic WEP are provided.



FIELD	DESCRIPTION
Dynamic WEP	
Dynamic WEP	For 802.1X security type, Dynamic WEP is always enabled to automatically generate WEP keys for encryption.
WEP Key Length	Select a key length from 64-bit or 128-bit.
Re-keying Period	The time interval (in seconds) for the dynamic WEP key to be updated.
RADIUS Server Settings (Primary/Secondary)	
Host	Enter the IP address or domain name of the RADIUS server.
Authentication Port	The port used by the RADIUS server.
Secret Key	The secret key for the system to communicate with the RADIUS server.
Accounting Service	Enabling this option allows accounting of login and logouts through the RADIUS server.
Accounting Port	The port number used by the RADIUS server for accounting purposes.
Accounting Interim Update Interval	The system updates accounting information to the RADIUS server every specified interval.

WPA-Personal

WPA-Personal is a pre-shared key authentication method.

FIELD	DESCRIPTION
Security Settings	
Cipher Suite	The cipher suite is the encryption method used.
Roaming Target AP List	When 802.11r is enabled, click the Configure button to display 802.11r Roaming Settings.
Pre-shared Key Type	You can select a PSK (Hex) or a passphrase as the key format.
Pre-shared Key	Enter the key value as the pre-shared key. The format and number of characters is dependent on the Pre-shared Key Type
Group Key Update Period	The time interval (in seconds) for the group key to be renewed.

WPA-Enterprise

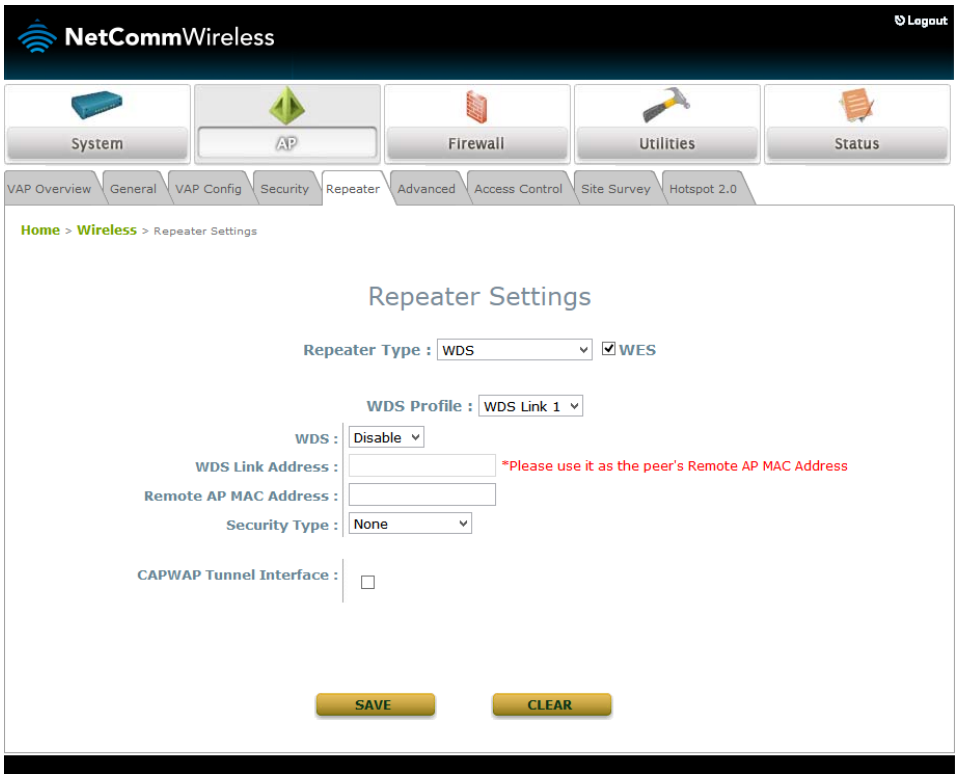
When selected, this option provides RADIUS authentication and data encryption.

FIELD	DESCRIPTION
Security Settings	
Cipher Suite	The cipher suite is the encryption method used.
Group Key Update Period	The time interval (in seconds) for the group key to be renewed.
RADIUS Server Settings (Primary/Secondary)	
Host	Enter the IP address or domain name of the RADIUS server.
Authentication Port	The port used by the RADIUS server.
Secret Key	The secret key for the system to communicate with the RADIUS server.
Accounting Service	Enabling this option allows accounting of login and logouts through the RADIUS server.
Accounting Port	The port number used by the RADIUS server for accounting purposes.
Accounting Interim Update Interval	The system updates accounting information to the RADIUS server every specified interval.

Repeater Settings

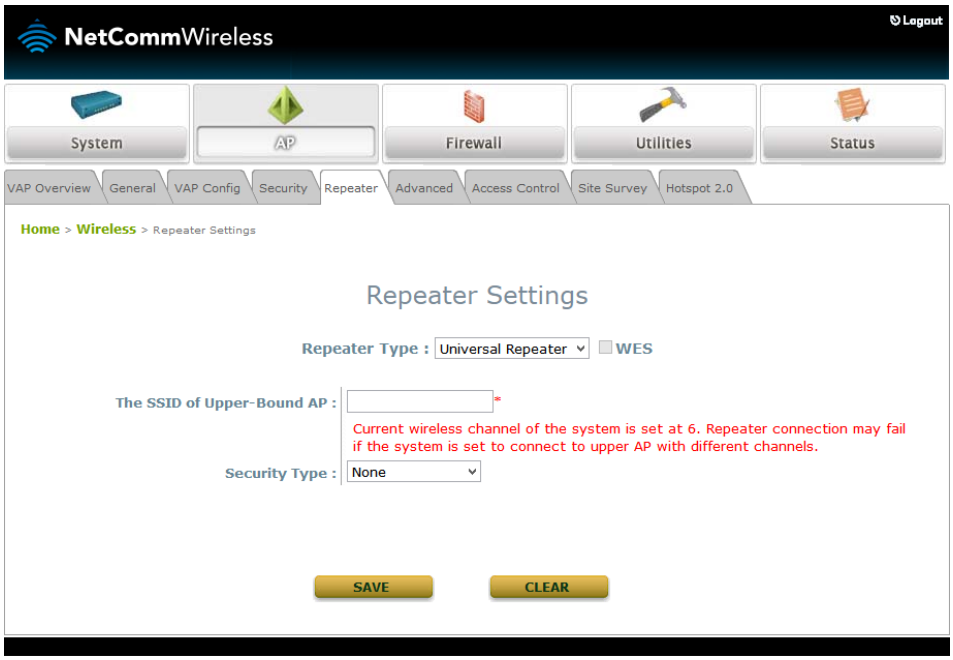
The NP731 access point is capable of using WDS or Universal Repeater mode to extend wireless network coverage. If WDS is enabled, the AP can support up to 8 WDS links to its peer APs per radio.

WDS



FIELD	DESCRIPTION
Repeater Settings	
WDS	Enables or Disables the WDS function.
WDS Link Address	The MAC address for the WDS interface.
Remote AP MAC Address	Enter the remote peer's MAC address.
Security Type	May be set to None, WEP or WPA-PSK. When this is set to None, there is no security on the WDS link.
CAPWAP Tunnel Interface	When selected, this designates WDS traffic to pass through the CAPWAP tunnel established between the AP and the controller.

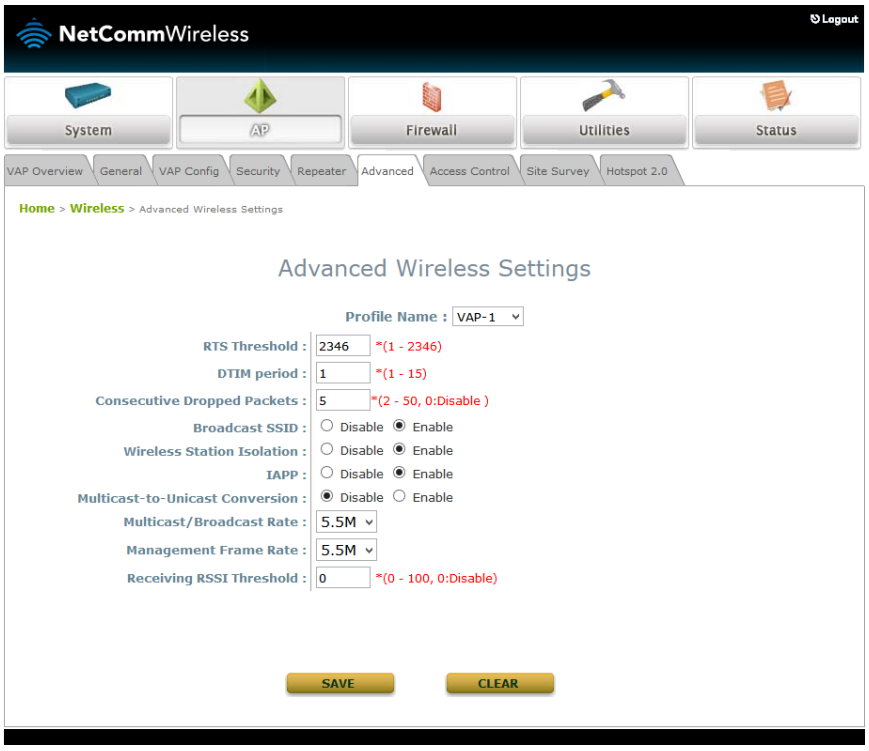
Universal Repeater



FIELD	DESCRIPTION
Repeater Settings	
The SSID of Upper-Bound AP	Enter the SSID of the upper-bound AP for the uplink connection.
Security Type	You can configure a security type for this connection but it must be the same as the upper-bound AP.

Advanced (AP mode)

The Advanced Wireless Settings page provides configuration options for data transmission settings. These parameters can be fine tuned to improve communication performance if a poor connection occurs.



FIELD	DESCRIPTION
Advanced Wireless Settings	
RTS Threshold	Request To Send (RTS) Threshold determines the packet size at which the system issues a request to send before sending the fragment to prevent the hidden node problem. The RTS mechanism is activated if the packet exceeds the value provided. A lower RTS Threshold setting can be useful in areas where many client devices are associating with the AP or in areas where the clients are far apart and can detect on the AP but not each other.
DTIM Period	Input the DTIM Interval that is generated within the periodic beacon at a specified frequency. A higher DTIM allows the wireless client to save energy but lowers throughput.
Consecutive Dropped Packets	This is the maximum number of transmission retries the AP will attempt when packet transmission is dropped before deciding the client is out of transmission reach. When transmission retries fail for the configured number of times, the access point drops the clients to optimize performance for other connected clients.
Broadcast SSID	When enabled, the access point's wireless network is visible to clients during a network scan. If disabled, the wireless client must know the SSID of the access point in order to connect to it.
Wireless Station Isolation	When enabled, clients may not communicate with one another and may only communicate with the access point.
IAPP	Inter Access Point Protocol (IAPP) is a protocol by which access points share information about the stations connected to them. When enabled, the system automatically broadcasts information about associated wireless stations to its peer access points.
Multicast-to-Unicast Conversion	When enabled, the access point intelligently forwards traffic only to those ports that request multicast traffic.
Multicast/Broadcast Rate	Allows the configuration of multicast/broadcast packet bandwidth.
Management Frame Rate	This feature controls the bandwidth for Management Frames. Higher rates result in shorter transmission range.
Receiving RSSI Threshold	To ensure quality connection speeds, a wireless client will not be allowed to connect unless it meets the configured minimum RSSI threshold.

Advanced (CPE Mode)

In CPE mode, the Advanced tab allows for configuration of advanced wireless settings such as RTS Threshold, Roaming and the ability to specify particular channels to use.

NetCommWireless
Logout
System
AP
Firewall
Utilities
Status
General
Advanced
Security
Site Survey
Home > Wireless > Advanced Wireless Settings
Advanced Wireless Settings
RTS Threshold : 2346 *(1 - 2346)
Roaming : Disable Enable
Background Scanning Period : 300 *(10 - 600 seconds)
Roaming Check RSSI Threshold : 15 *(15 - 85)
Choose Scan and Connect Channels: Disable Enable
Channel Selector: All 2.4 GHz 5 GHz DFS
2.4GHz list: 1 2 3 4 5 6 7 8 9 10 11 12 13
5GHz list: 36 40 44 48 52 56 60 64 100 104 108 112 116 120 124 128 132 136 140
SAVE
CLEAR

FIELD	DESCRIPTION
Advanced Wireless Settings	
RTS Threshold	Request To Send (RTS) Threshold determines the packet size at which the system issues a request to send before sending the fragment to prevent the hidden node problem. The RTS mechanism is activated if the packet exceeds the value provided. A lower RTS Threshold setting can be useful in areas where many client devices are associating with the AP or in areas where the clients are far apart and can detect on the AP but not each other.
Roaming	When enabled, you are able to select the interval at which the NP731 performs a background scan for the RSSI. You may also configure the RSSI threshold that determines when the NP731 switches between access points.
Choose Scan and Connect Channels	When enabled, you are able to select the bands and channels that the NP731 will scan for.

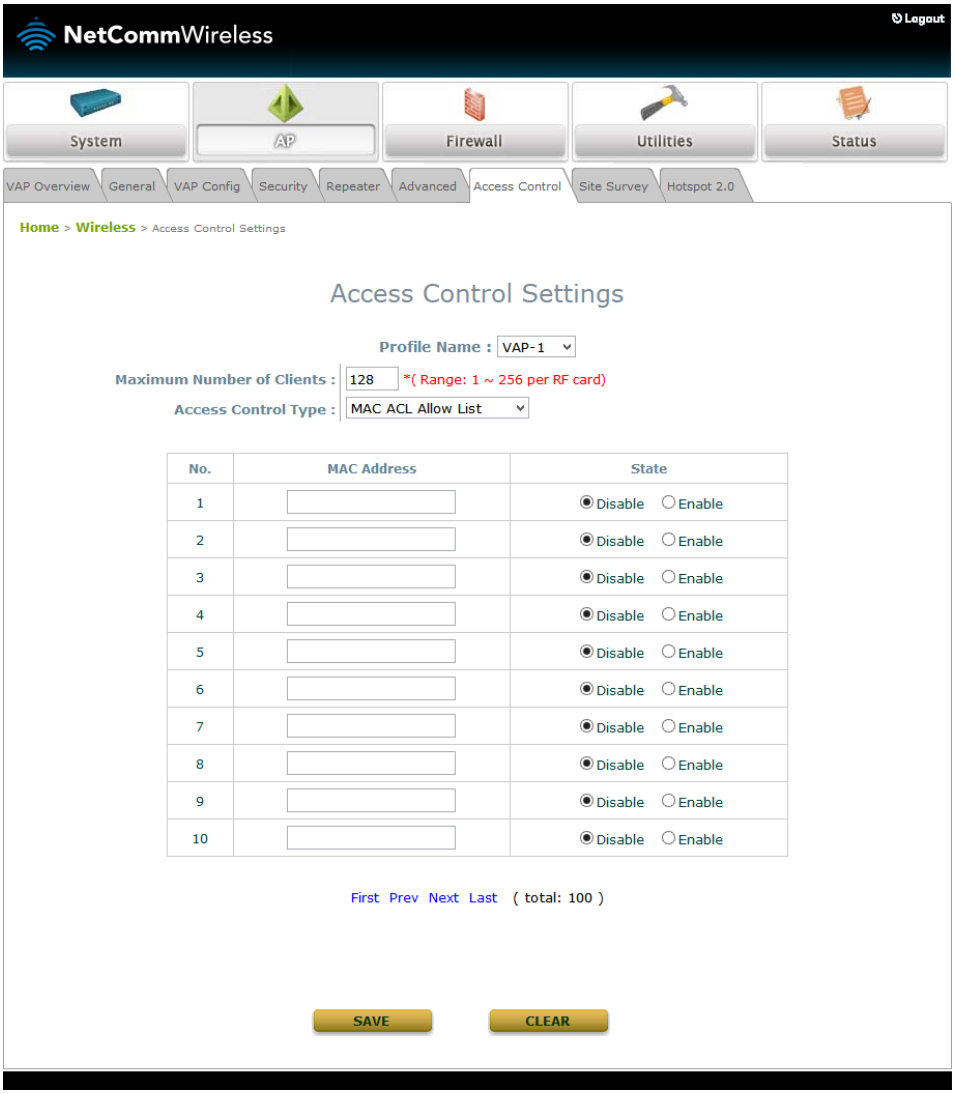
Access Control

This page allows the administrator to configure a maximum number of clients and to specify an access control method.

FIELD	DESCRIPTION
Access Control Settings	
Maximum Number of Clients	Specifies the maximum number of clients that may connect to the access point.
Access Control Type	Allows you to specify an access control type. Available options are Disabled, MAC ACL Allow List, MAC ACL Deny List and RADIUS ACL.

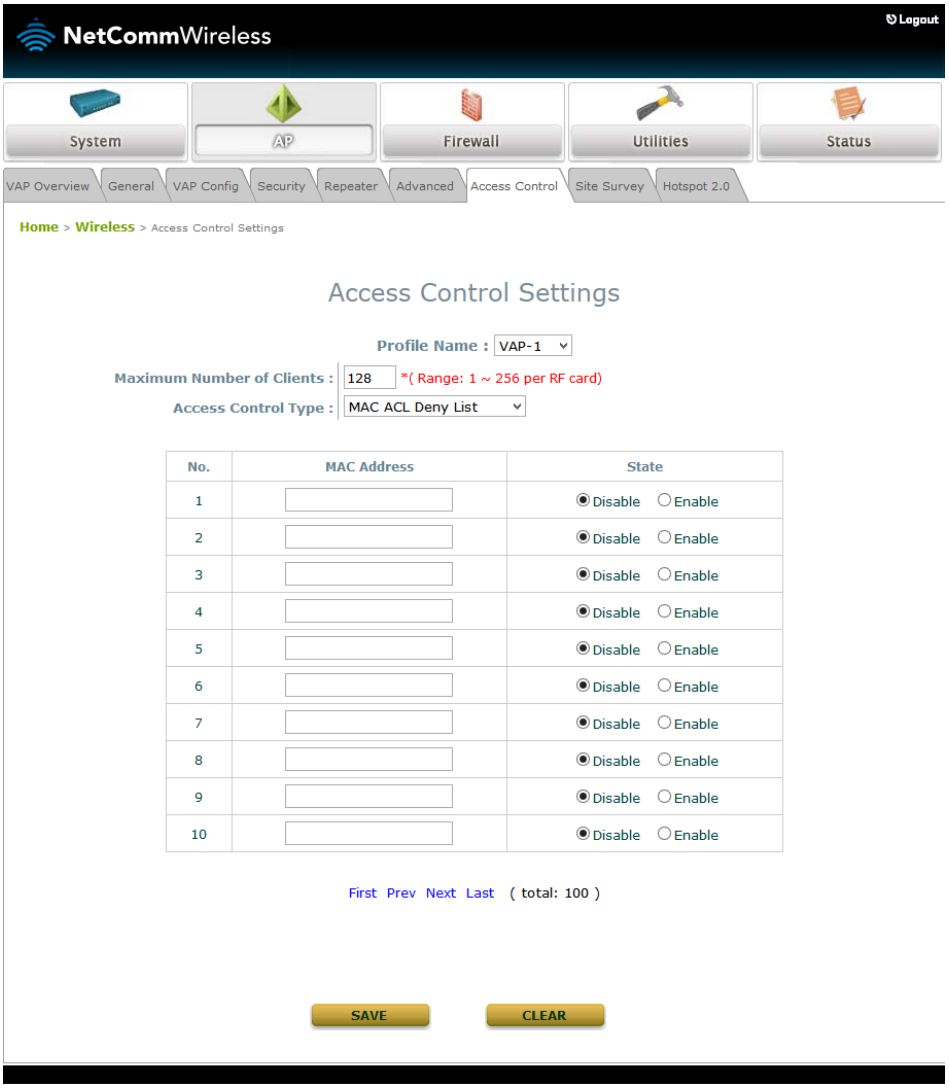
MAC ACL Allow List

When selecting MAC ACL Allow List, only the client devices identified by their MAC addresses listed in the Allow List are granted access to the system. The administrator can temporarily block any allowed MAC address by checking **Disable**.



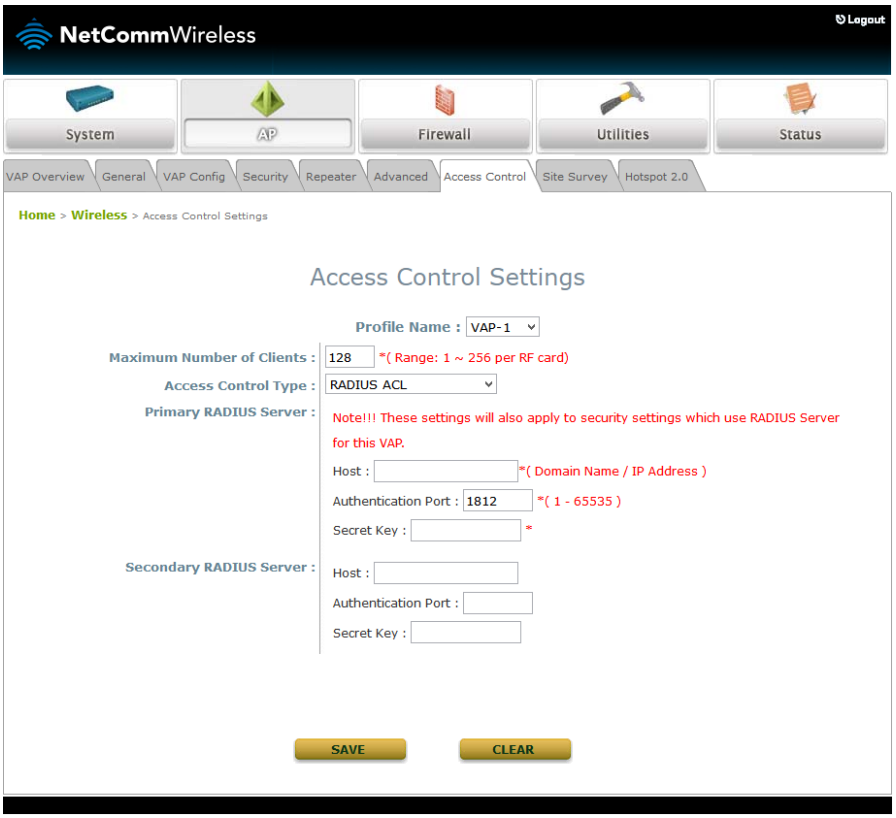
MAC ACL Deny List

When selecting MAC ACL Allow List, all clients except those listed in the Deny List are granted access to the system. The administrator can temporarily allow any denied MAC address by checking **Disable**.



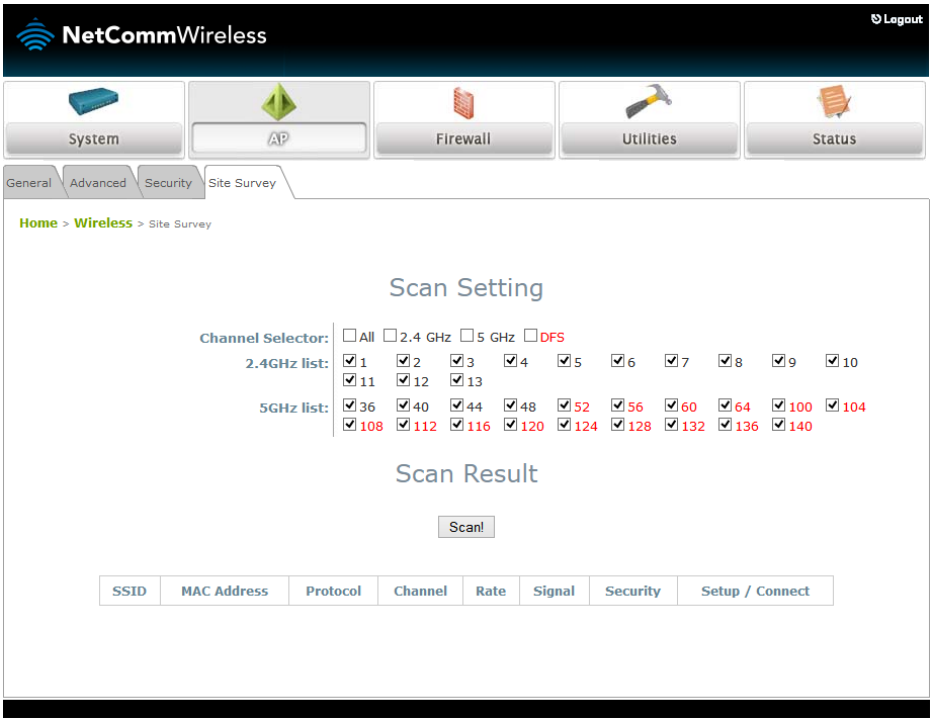
RADIUS ACL

Authenticate incoming MAC addresses by an external RADIUS server. Use these settings to specify the address, port and secret key to the RADIUS server.



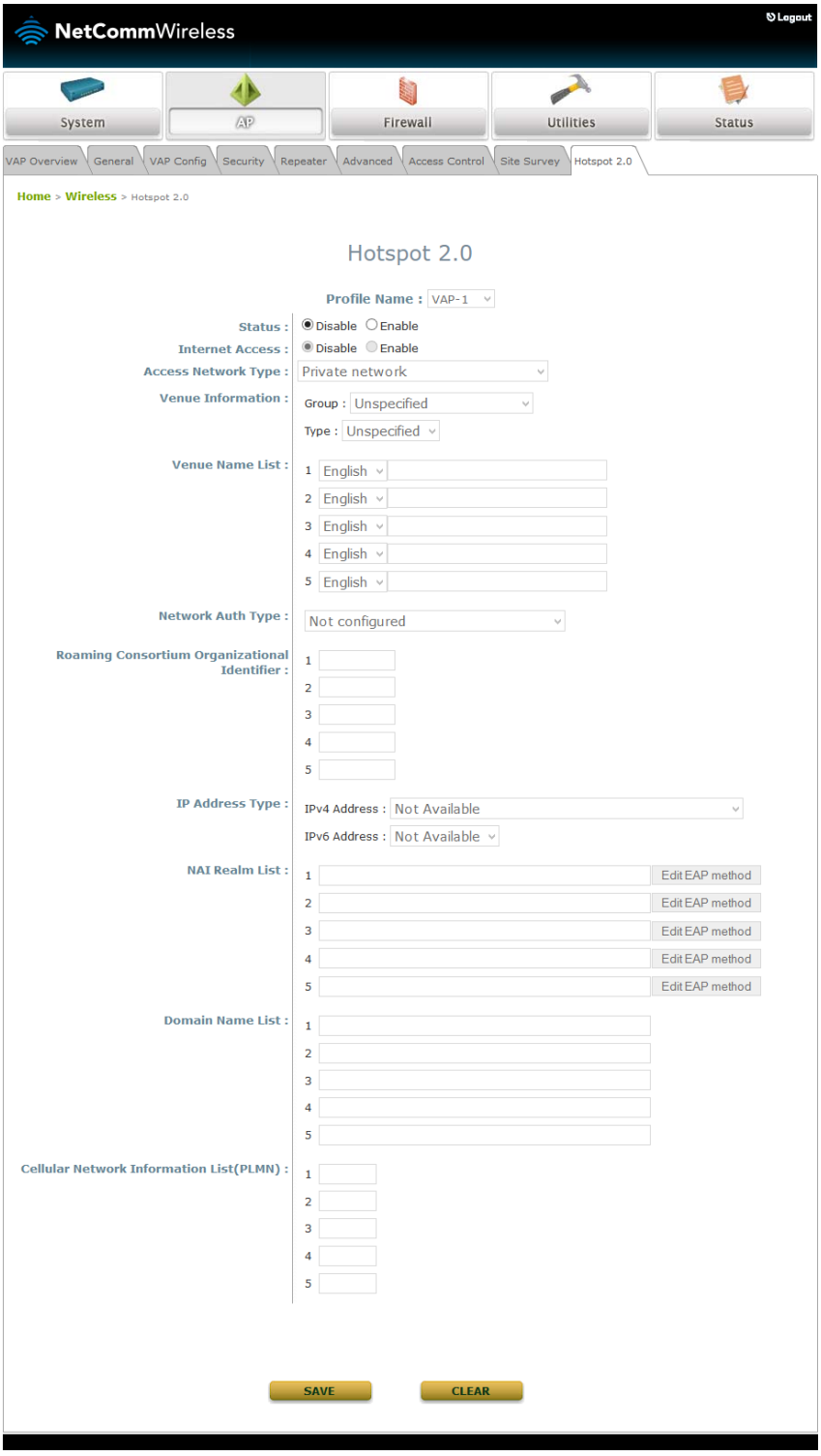
Site Survey

The access point can scan for available wireless networks within its range. The administrator can then select a network to connect to. This option is only available when the AP is in CPE mode or when one of the repeater modes is enabled. Select the desired channels to scan and then press the **Scan!** Button. Click the Setup button next to the desired network then enter the required authentication details in the section that appears below.



Hotspot 2.0

The NP731 may be used as a hotspot providing WiFi access to the public

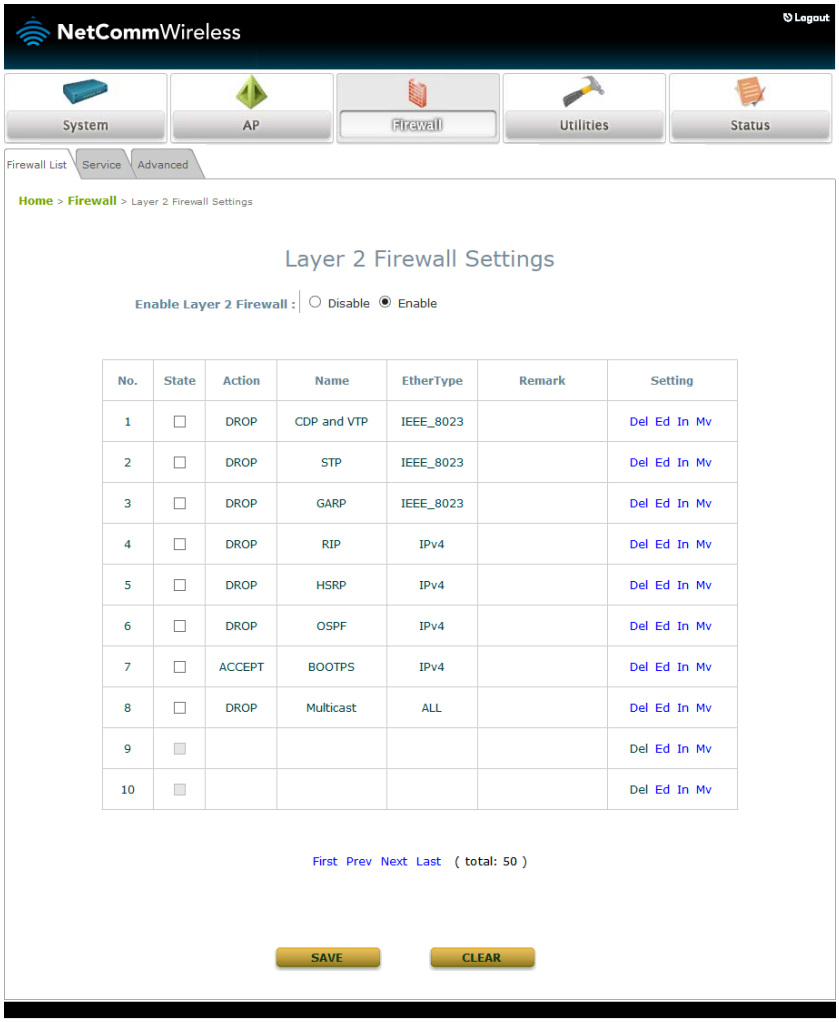


FIELD	DESCRIPTION
Hotspot 2.0	
Status	Enable of disable the hotspot function.
Internet Access	When enabled, the wireless clients are allowed access to the internet.
Access Network Type	Private: Home and Enterprise Networks Private and Guest Access: Enterprises offering guest connectivity Chargeable Public Network: Available to all but requires a fee. Free Public Network: Available to all without fees. Personal Device Network: For peripherals in an ad-hoc mode. Emergency Services Test/Experimental/Wild Card
Venue Information	The Group/Type of the venue is selected here. This identifies the general class of the venue and the specific type of venue within each group.
Venue Name List	The name of the venue for the network which may be useful to end users for network selection.
Network Authentication Type	The additional steps to acquire access for an unsecure network • Acceptance of terms and conditions • Online enrolment supported • HTTP/HTTPS redirection • DNS redirection
Roaming Consortium Organizational Identifier	A roaming consortium is a group of service providers with which a user's credentials can be used for authentication. Roaming consortiums are identified by an organization identifier (OI) that is assigned by the IEEE – similar to the first half of a MAC address. An OI is often 24-bits in length but can also be 36-bits.
IP Address Type	IPv4 or IPv6.
NAI Realm List	An NAI Realm identifies the proper authentication server or domain for the user's authentication exchange. By discovering which authentication realms are supported by a network, a mobile device can selectively authenticate to its preferred networks.
Domain Name List	Lists one or more domain names for the entity operating the AP. This is critical for Hotspot 2.0 network selection policy as it identifies the operator of the network. It indicates to the mobile device whether it is at home or connected to a visitor hotspot.
Cellular Network Information List (PLMN)	Identifies 3GPP cellular networks available through the AP. Specifically, this field identifies the Public Land Mobile Network (PLMN) ID, comprised of the Mobile Country Code (MCC) and Mobile Network Code (MNC) of the mobile operator.

Firewall

Firewall List

The NP731 features a layer 2 firewall which provides an extra level of security on possible threats coming from or going to WLAN interfaces.

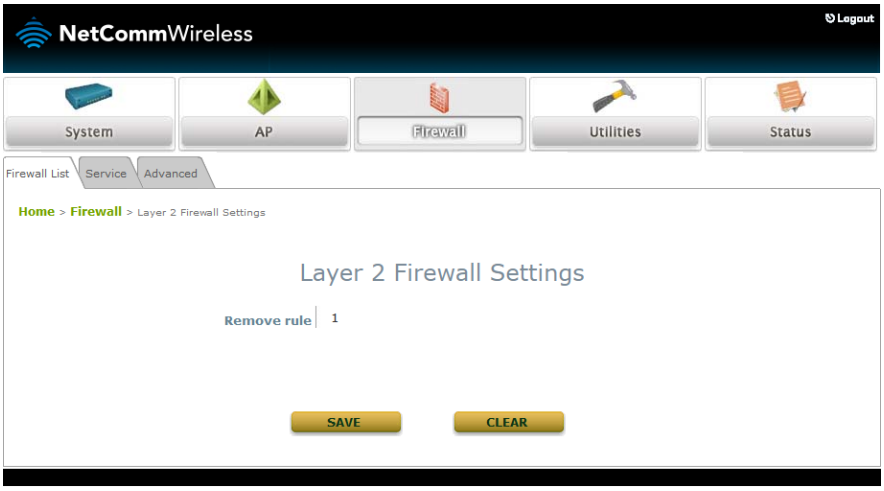

NetCommWireless
Logout
System
AP
Firewall
Utilities
Status
Firewall List
Service
Advanced
Home > Firewall > Layer 2 Firewall Settings
Layer 2 Firewall Settings
Enable Layer 2 Firewall : Disable Enable
No. State Action Name EtherType Remark Setting
1 DROP CDP and VTP IEEE_8023 Del Ed In Mv
2 DROP STP IEEE_8023 Del Ed In Mv
3 DROP GARP IEEE_8023 Del Ed In Mv
4 DROP RIP IPv4 Del Ed In Mv
5 DROP HSRP IPv4 Del Ed In Mv
6 DROP OSPF IPv4 Del Ed In Mv
7 ACCEPT BOOTPS IPv4 Del Ed In Mv
8 DROP Multicast ALL Del Ed In Mv
9 Del Ed In Mv
10 Del Ed In Mv
First Prev Next Last (total: 50)
SAVE
CLEAR

The firewall list may contain up to 20 rules. The table below describes the fields of the firewall list.

FIELD	DESCRIPTION
Layer 2 Firewall Settings	
No.	The number determines the priority of the rule in the firewall list.
State	When a rule is checked, it is enabled. Rules which are not checked are disabled.
Action	DROP indicates a block rule while ACCEPT indicates a pass rule.
Name	The name of the rule.
EtherType	Indicates the type of traffic subjected to this rule.
Remark	Displays any notes configured for the rule.
Setting	There are 4 actions available. • Del: Click to delete the rule • Ed: Click to edit the rule. • In: Click to insert a rule • Mv: Click to move the rule.

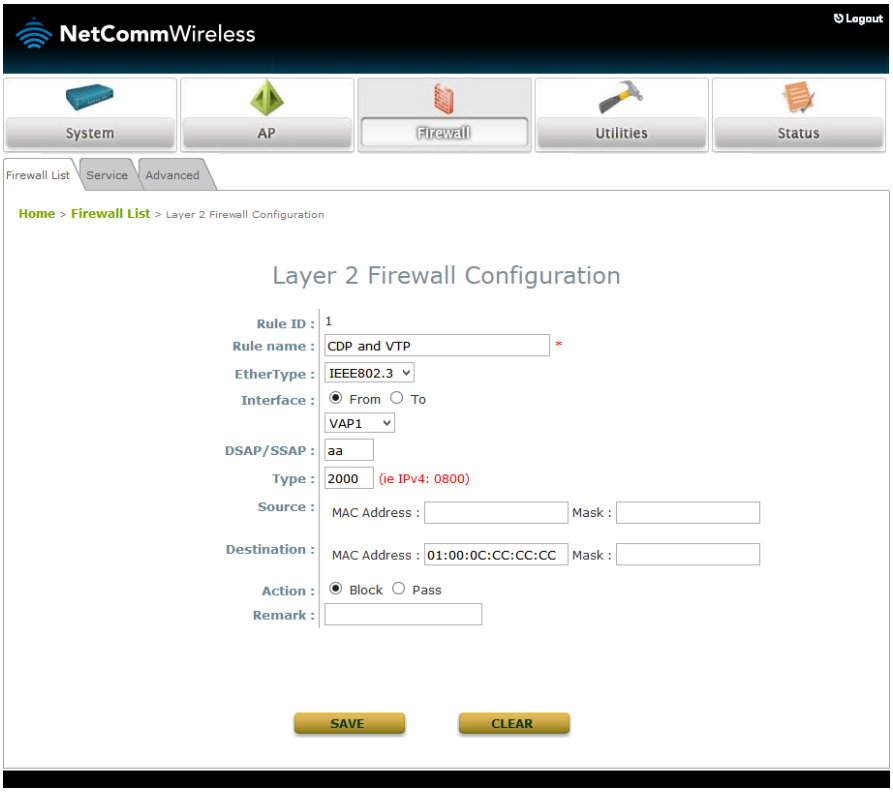
Deleting a specific rule

Select the **Del** option next to the rule you wish to delete, then click the **Save** button.



Editing a specific rule

Select the **Ed** option next to the rule you wish to edit. Adjust the settings you desired then click the **Save** button when you have finished.



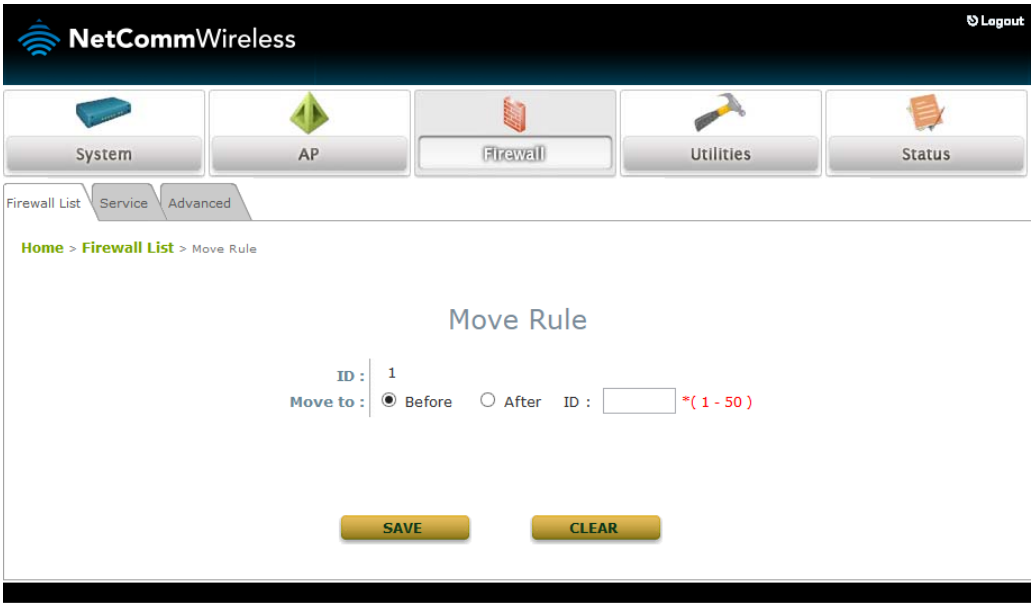
FIELD	DESCRIPTION
Layer 2 Firewall Configuration	
Rule ID	The rule ID determines the priority that the rule has among other firewall rules.
Rule Name	A name given to the rule for easy identification.
EtherType	Provides available types of traffic subjected to this rule.
Interface	Indicates the virtual access point and the direction of this rule.
DSAP/SSAP	This is only displayed when EtherType is IEEE 802.3. The value can be further specified for fields in the 802.2 LLC frame header.
Type	This is only displayed when EtherType is IEEE802.3. This field is used to indicate the type of encapsulated traffic.
VLAN ID	This is only displayed when EtherType is 802.1Q. The VLAN ID is provided to associate with certain VLAN-tagging traffic.
Priority	This is only displayed when EtherType is 802.1Q. Indicates the priority level with associated VLAN traffic.
Encapsulated Type	This is only displayed when EtherType is 802.1Q. Used to indicate the type of encapsulated traffic.
Opcode	This is only displayed when EtherType is ARP/RARP. This list can be used to specify the ARP Opcode in the ARP header.
Source	MAC address/mask indicates the source MAC; IP address/mask indicates the source IP address when EtherType is IPv4; ARP IP/MAC and Mask indicate the ARP payload fields.
Destination	MAC address/mask indicates the destination MAC; IP address/mask indicates the destination IP address when EtherType is IPv4; ARP IP/MAC and Mask indicate the ARP payload fields.
Action	Valid actions are block or pass.
Remark	Use this field to specify any notes particular to this rule.

Inserting a rule

Select the **In** option to create a new rule in the selected slot.

Moving a rule

Select the **Mv** next to the desired rule to move it up or down the list to alter its priority. The Move Rule screen is displayed and you are able to move the rule before or after a specified rule number. Click the Save button when you have finished.

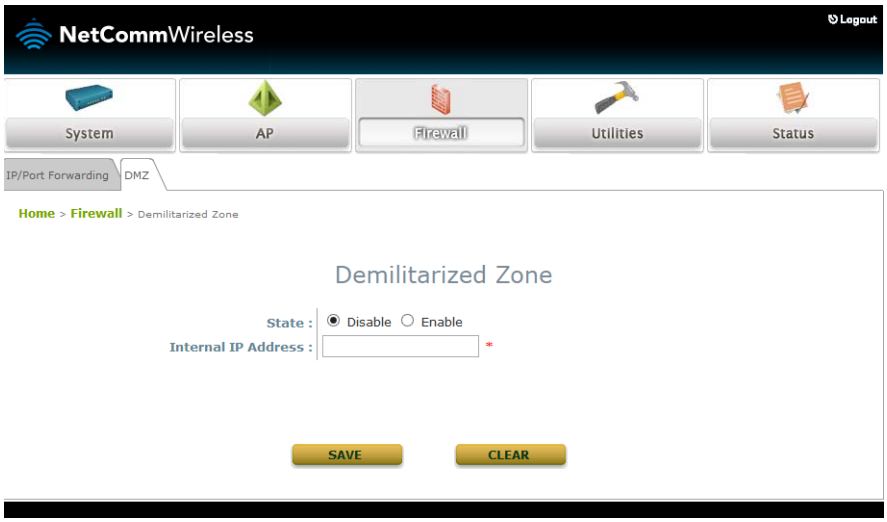


IP/Port Forwarding (CPE mode only)

FIELD	DESCRIPTION
IP/Port Forwarding	
Service Name	The administrator can provide an easy to remember alias for the specific forwarding rule.
External Port Range	The range of external ports for forwarding traffic can be defined manually by the administrator.
Internal IP Address	Enter the LAN IP address to receive the forwarding traffic.
Protocol	Forwarding traffic protocol can be selected from the drop-down list to be TCP/UDP, TCP or UDP.
Add	Click to activate the new rule.
IP/Port Forwarding	Displays the details of the current services available. Click Delete to remove the specified service. Click Edit to configure the current setting.

DMZ (CPE mode only)

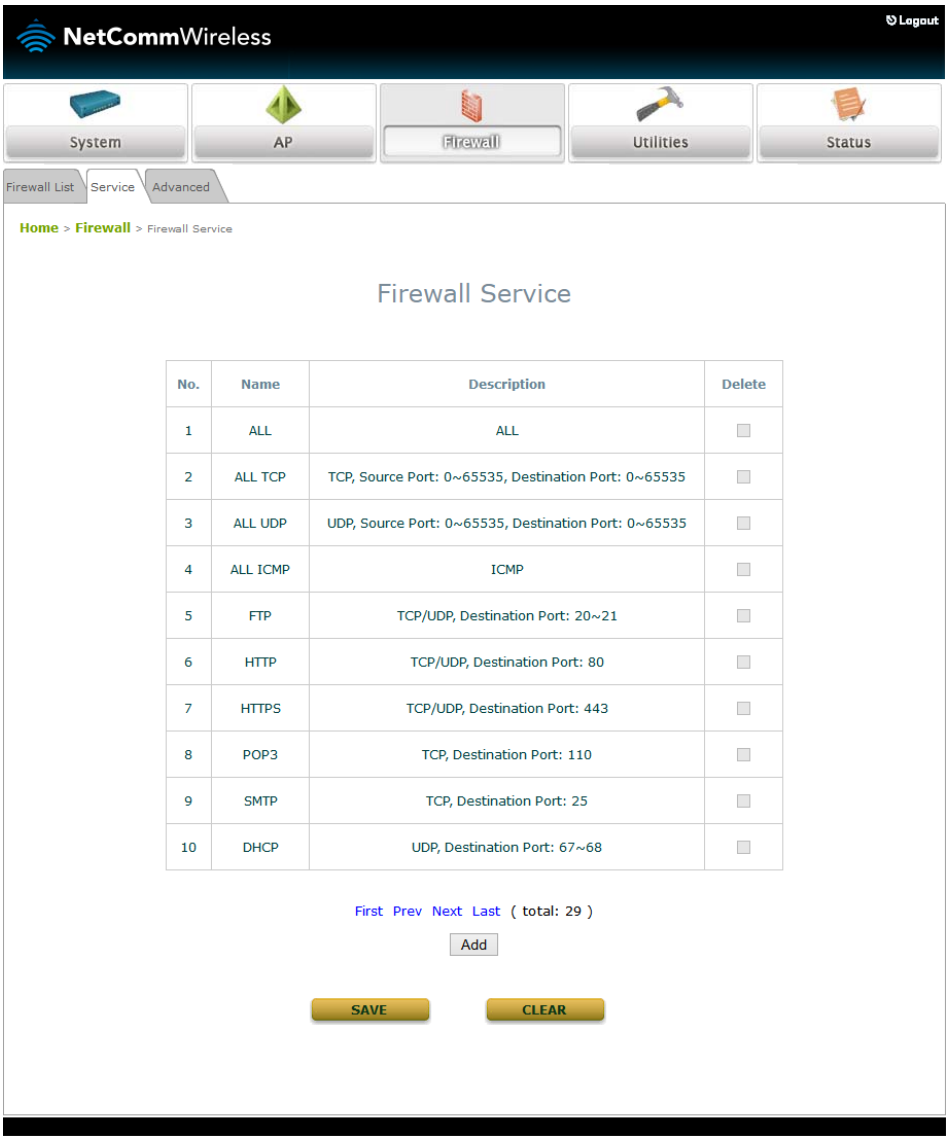
The DMZ (Demilitarized Zone) allows one local computer or server (used as a DMZ Host) to be exposed to the Internet for special purpose Internet services such as functioning as a web server. External users can access the DMZ host without authentication.



FIELD	DESCRIPTION
Demilitarized Zone	
State	Select Enable to activate this function or Disable to de-activate it.
Internal IP Address	Fill in the internal IP address to allow the system to forward traffic other than those listed in the specific IP/Port Forwarding list.

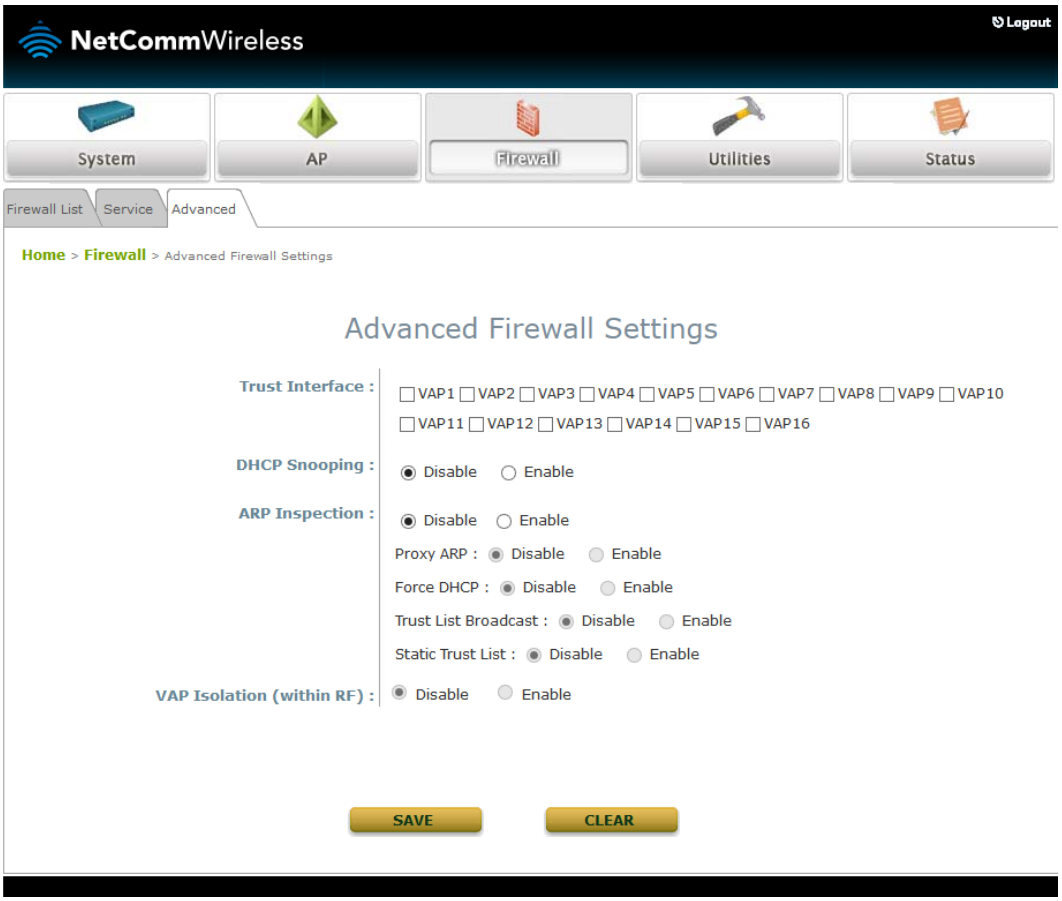
Service

The administrator can add or delete firewall services here. The services in this list become options that are selectable in the firewall rules (when EtherType is set to IPv4). The access point provides a list of rules to block or pass traffic of layer-3 or above. These services are available to choose from a drop-down list of layer2 firewall rules on the Edit page. The first 28 entries are default settings and may not be deleted but may be disabled. Click the **Save** button to save your changes when you have finished.



Advanced

This page provides additional settings for firewall rules.



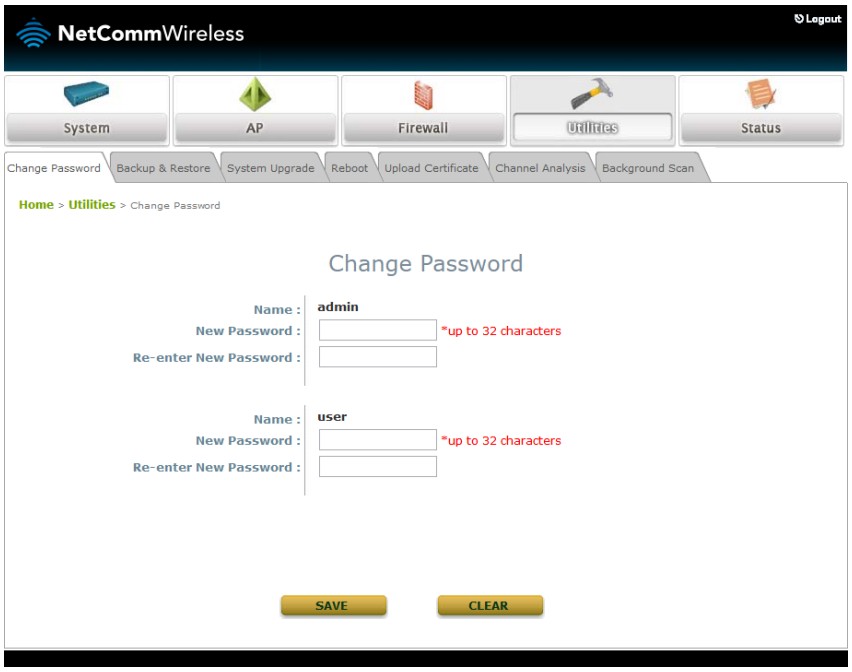
FIELD	DESCRIPTION
Advanced Firewall Settings	
Trust Interface	Each VAP interface can be checked individually to mark as trusted interfaces. Security enforcements on DHCP/ARP like DHCP snooping and ARP inspection are carried out on non-trusted interfaces.
DHCP Snooping	When enabled, DHCP packets are validated against possible threats like DHCP starvation attack. Additionally, the trusted DHCP server (IP/MAC) can be specified to prevent rogue DHCP servers.
ARP Inspection	When enabled, ARP packets are validated against ARP spoofing. • Proxy ARP: when enabled, AP replies to ARP requests on behalf of the downlink stations. The ARP table maintained by the access point is used as a look up table upon receipt of an ARP request from the AP uplink. Adversely, without Proxy ARP, ARP requests are broadcast down in the AP's wireless network causing inefficiencies. • Force DHCP: when enabled, the AP only learns MAC/IP pair information through DHCP packets. Since devices configured with static IP addresses do not send DHCP traffic, any clients with static IP addresses will be blocked from internet access unless its MAC/IP pair is listed and enabled in the Static Trust List. • Trust List Broadcast: when enabled, this let's other Aps (with L2 firewall feature) to learn the trusted MAC/IP pairs to issue ARP requests. • Static Trust List: used to add MAC or MAC/IP pairs of devices that are trusted to issue ARP requests. Other network nodes can still send their ARP requests, however, if their IP appears on the static list (with a different MAC), their ARP requests will be dropped to prevent eavesdropping.
VAP Isolation (within RF)	Clients on different VAPs on the same RF card are isolated.

Utilities

The Utilities pages provide administrators with various means of maintaining the system.

Change Password

Using this page, you may change the administrator account password or the user account password. A maximum of 32 alpha-numeric characters are allowed in a password. When you have finished making changes, click the **Save** button to have them take effect. The user account is not able to modify many settings and is generally used for users to monitor the status of the access point.



Backup & Restore

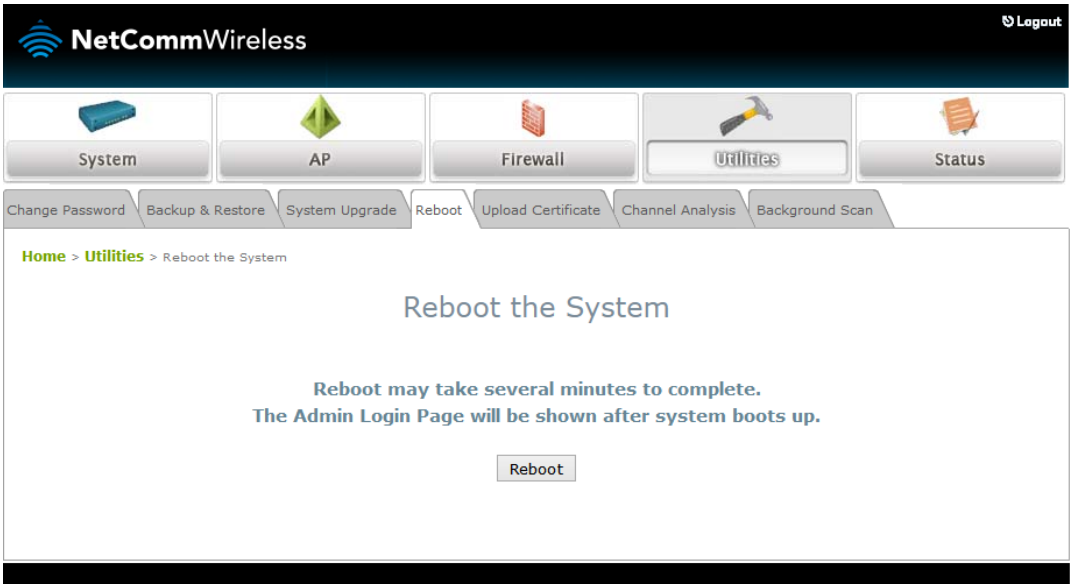
This function is used to back up and restore the configuration of the access point. To back up the NP731 settings, click the **Backup** button then choose a location to save the configuration file. To restore the configuration file to the access point, click the **Browse** button and locate the file, then click the **Restore** button.

System Upgrade

This page allows the system administrator to upgrade the firmware of the access point. There are two methods by which the access point may be upgraded; via the web user interface or via TFTP server.

Reboot

This page is used to reboot the access point. The access point may require a reboot when configuration changes are made.

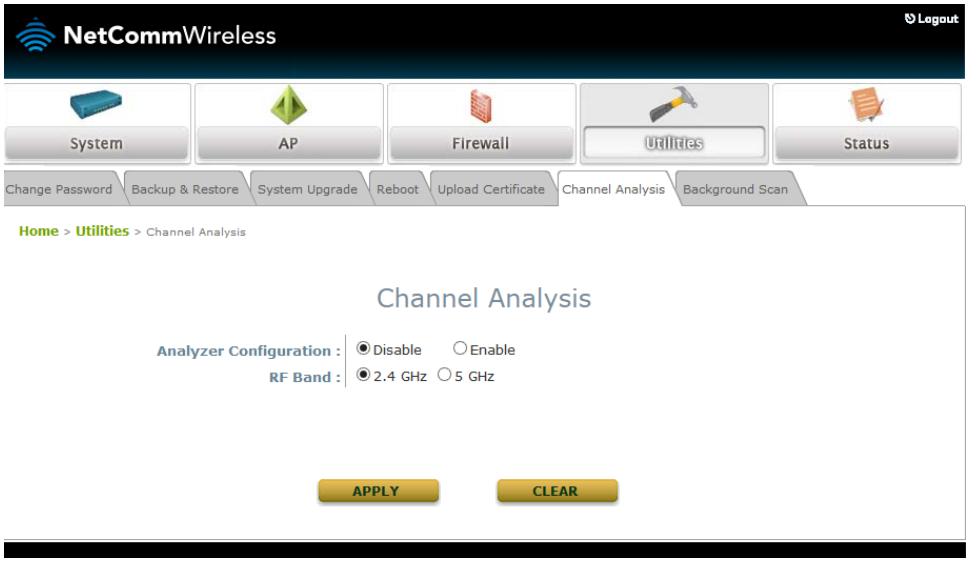


Upload Certificate

This page allows administrators to upload security certificates for use with CAPWAP.

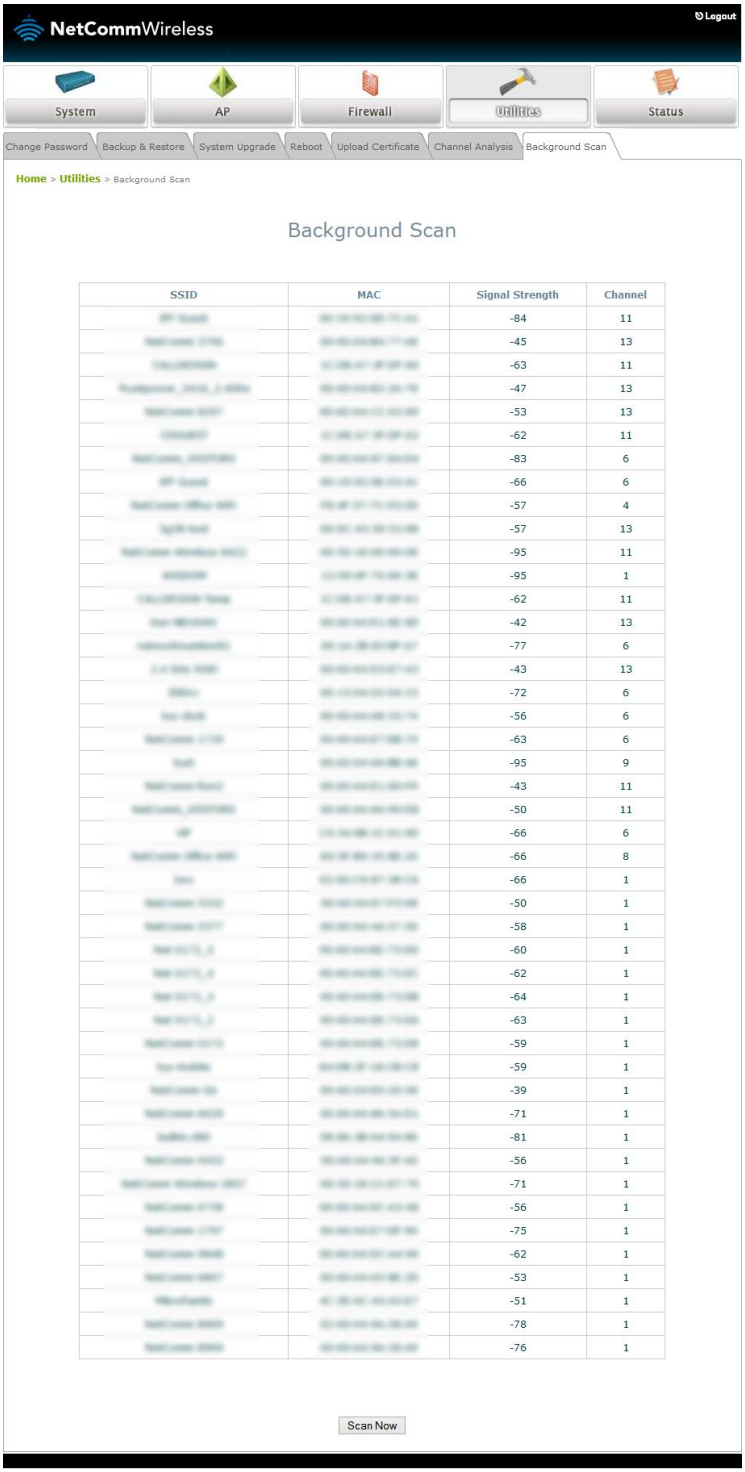
Channel Analysis

This tool is for use by administrators to chart the channel dynamics. It presents a spectrogram, density graph and other charts to detect interference from other Bluetooth, microwave and cordless devices.



Background Scan

The background scan function can be used in conjunction with the channel analysis tool for diagnostics. Press the Scan Now button to trigger the AP to scan for wireless networks in range. This is done in the background and does not affect normal operation.

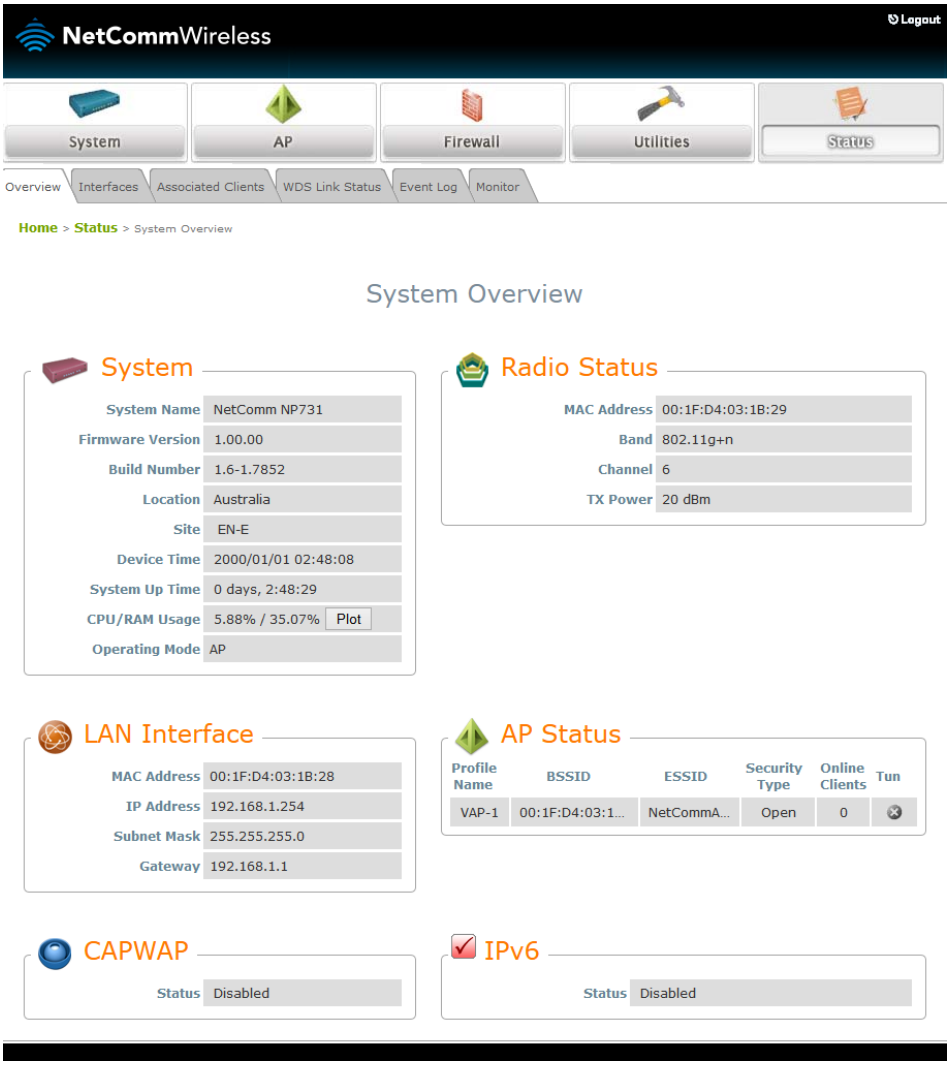


Status

The Status pages provide information about the current status of the access point's many functions.

Overview

Upon logging in to the access point, you are presented at the Overview tab of the Status page. This page gives an overview of the settings and status of the access point



FIELD		DESCRIPTION
System Overview		
System	System Name	The system name given to the access point.
	Firmware Version	The current firmware version in use on the AP.
	Build Number	The build number of the firmware in use on the AP.
	Location	The location of the AP.
	Site	The site code of the AP.
	Device Time	The current system time on the AP.
	System Up Time	The amount of time that the AP has been in operation.
	CPU/RAM Usage	Displays the CPU/RAM utilization.
LAN Interface	MAC Address	The MAC address of the LAN interface.
	IP Address	The IP address of the LAN interface.
	Subnet Mask	The Subnet Mask of the LAN interface.
	Gateway	The Gateway of the LAN interface.
Radio Status	MAC Address	The MAC address of the wireless radio.
	Band	The radio band in use.
	Channel	The channel in use.
	Tx Power	The transmission power of the wireless radio.
AP Status	Profile Name	The profile name of the access point.
	BSSID	Basic Service Set ID
	ESSID	Extended Service Set ID
	Security Type	Security type of the virtual access point.
	Online Clients	The number of online clients.
	Tunnel	The status of the used tunnel.
IPv6	Status	Enabled/Disabled.
CAPWAP	Status	Enable/Disabled.

Interfaces

This page displays the traffic information per interface. Click the **Plot** button to display the traffic information in a graph format.

Associated Clients

The administrator can remotely oversee the status of all associated clients on this page. When a low signal-to-noise ratio is found here, the administrator can tune the corresponding parameters or investigate the settings of associated clients to improve network performance.

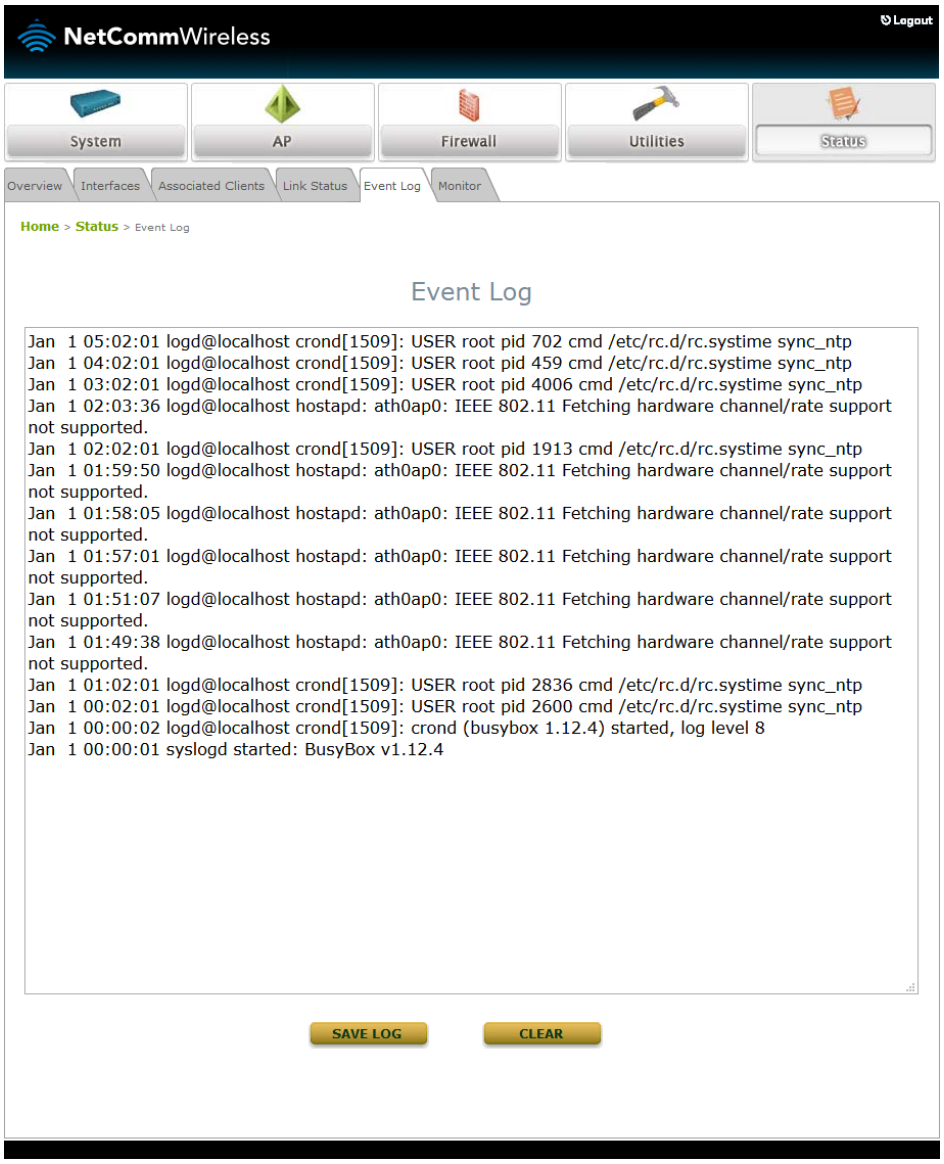
FIELD	DESCRIPTION
Associated Client Status	
Associated VAP	The name of the virtual AP that the client is associated with.
ESSID	The Extended Service Set ID which the client is associated with.
MAC Address	The MAC address of associated clients.
RSSI	The Received Signal Sensitivity Index of the respective client's association.
Packet Error Ratio	Indication of the associated client's service quality to see if packets are not received.
Idle Time	Time period, in seconds, that he associated client is inactive for.
Up Time	Time period, in seconds, that the client is associated for.
Real Time	A real time plot of each associated client's traffic information including packets in/out, traffic in/out in Kb, RSSI, Uplink/Downlink rates etc.

Link Status

This page displays the status of the wireless link between the NP731 and the upper-bound access point.

Event Log

The event log provides a record of system activities. The administrator can monitor the system status by checking this log.


NetCommWireless
Logout
System
AP
Firewall
Utilities
Status
Overview
Interfaces
Associated Clients
Link Status
Event Log
Monitor
Home > Status > Event Log
Event Log
Jan 1 05:02:01 logd@localhost crond[1509]: USER root pid 702 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 04:02:01 logd@localhost crond[1509]: USER root pid 459 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 03:02:01 logd@localhost crond[1509]: USER root pid 4006 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 02:03:36 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 02:02:01 logd@localhost crond[1509]: USER root pid 1913 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 01:59:50 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 01:58:05 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 01:57:01 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 01:51:07 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 01:49:38 logd@localhost hostapd: ath0ap0: IEEE 802.11 Fetching hardware channel/rate support not supported.
Jan 1 01:02:01 logd@localhost crond[1509]: USER root pid 2836 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 00:02:01 logd@localhost crond[1509]: USER root pid 2600 cmd /etc/rc.d/rc.systime sync_ntp
Jan 1 00:00:02 logd@localhost crond[1509]: crond (busybox 1.12.4) started, log level 8
Jan 1 00:00:01 syslogd started: BusyBox v1.12.4
SAVE LOG
CLEAR

Monitor

This page gives a summary of the CPU utilization, memory usage, associated station numbers, TX rate distribution, airtime utilization and short retries.